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**THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE,**

**EDITED BY**

**F. J. S. GORGAS, M. D., D. D. S.**

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**VOL. 4.—THIRD SERIES.**

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**BALTIMORE:  
SNOWDEN & COWMAN.  
LONDON:  
TRUBNER & CO., 60 PATERNOSTER ROW.**

**1871.**

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THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.      THIRD SERIES--MAY, 1870.      No. 1.

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ARTICLE I.

*The Discovery of Cells with Fibres in Dentine at the Junction of the Enamel and Cementum.*

By GEO. B. HARRIMAN, D. D. S., Boston.

In the Dental "Cosmos" for February of the present year, there is an article on the development of cells of the dentinal pulp into tubuli.

In his introductory, the author premises that "the effect of this tubular arrangement within the structure of the dentine is a matter which not only interests those who study Dentistry as an art, but that other class who are devoted to it as a science." With this utterance I am in entire sympathy and particularly with the concluding part, the consideration of Dentistry as a science. Scientifically considered, I must take exceptions to principles submitted in the article now under consideration.

What are we to understand by the term tubuli?

By Kolliker and almost every other writer on the subject "tubes and tubuli are hard pipes which admit of the passage of fluid." By the author of the article in question, they are likened to the "tubes of a boiler and hollow columns of a building."



My researches and long continued study, lead me *away* from such histology and physiology as this.

From repeated experiments, I am prepared to demonstrate and prove that these so styled "tubuli" are cells and fibres which radiate from the pulp cavity and terminate at the junction of the enamel and cementum. At this point these cells and fibres can be frequently seen as real soft solids, as much so as the fibres and cells in cartilage.

A careful examination with a microscope of medium high power, from four to seven hundred diameters, will soon convince us that no fluid passes in these so called "tubuli." What is seen are calcareous salts. As an illustration of this position, take a freshly extracted tooth extirpate its pulp, then inject it with carmine, and afterwards make thin sections longitudinally, crossing of course the so called "*tubuli*," but not interfering with the pulp cavity, and the experiment will show *no* entrance of carmine into these "pipes." Whereas had they been *hollow*, the carmine would have penetrated at once and have filled them.

It is to be presumed that every writer upon this subject has made the tooth a matter of profound study, and has summoned to this aid the wise and learned, who likewise have largely investigated and have given to the world the results of their investigations. It is to be borne in mind, however, that Dentistry as a science in just in its dawn, and that, consequently, past investigations were pursued in comparative darkness. This dawn is rapidly increasing in effulgence and chases back the clouds of the past, making light so clear and bright as to allow every *open* eye to behold the truth and welcome it to the heart and intellect. In these "tubuli" are seen real *cells* and *fibres*, nothing more nothing less. The interrogatory may now be put, what are the functions of these cells and fibres?

I answer their office is to build up the dentine of the tooth by the deposit of calcareous salts, which are their *only* contents.

According to Kolliker, these cells and fibres, as I denomi-

nate them or as they are otherwise called "tubuli" are about the ten thousandth of an inch, but select the scale of Bealing for measurement they are really about the five thousandth of an inch. When disencumbered, their measurement is from the thirty-five hundredth to the four thousandth of an inch, thus showing that they *swell* when released from surrounding substance. I have made a great number of very thin sections of the teeth, as thin as the three thousandth of an inch.

It may be interesting to the reader to be made acquainted with the process. These sections can be made of any desired size and attenuated to any point—from two hundredths to three thousandths of an inch. My process is to glue the tooth into a piece of wood, and fasten the wood in a lathe where there is a carriage which runs in a rack, or pinion with a tool post to guide the cutting instrument. In this way I obtained a section after my own desire.



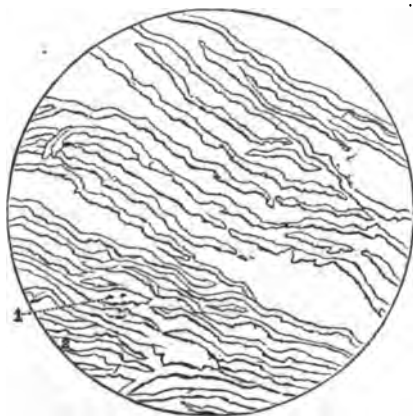
Cut No. 1 represents the fibres and cells of a central incisor tooth; (1) in this cut shows the nuclei in the cells after application of diluted acetic acid; (2) shows cells closely impacted; (3) shows the interstitial substance or lime salts.

Placing one of them on a glass slide, with a microscope having a prism in the objective as well as reflected light from beneath the object, I have seen the dissolution of the

hard substance, and the enlargement or *swell* of the cells and fibres, from about the five thousandth of an inch to the thirty-five hundredth of an inch in diameter. "Tubuli" are compared, in the article we are noticing, to the hollow tubes in long bone, woody fibres, etc.

From the preceeding remarks, the reader is prepared for my protest against such a theory. There are no "Tubuli" in woody fibres, nor is there any hollow tube in bone as I can clearly prove, and as cut 2. illustrates. Bone has cells and fibres which can be readily detected and exposed by making thin sections, after the manner already indicated above, the twenty-five hundredth or three thousandths of an inch in diameter, and employing hydrochloric acid to dissolve the hard substance; which experiment I would commend to all interested.

Cut No. 2, represents the fibres and cells in bone. Figure 1 in this cut shows the nuclei in the cells, and figure 2 shows the basis substance.



The soft solids within the cementum of the tooth, are analogous to those in bone, and are composed of cells and fibres, and there are no hollow tubes or canals in the cementum.

The matter presented in this article is of much importance, and cannot fail to interest every one engaged in the den-

tal or medical profession. It may provoke thought, and excite to research and experiment, and thus more light may be obtained for the better understanding of this branch of science.

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## ARTICLE II.

### *Mechanical Dentistry.*

By J. Z. HOFFER, D. D. S.

Taking an impression of the mouth may be considered a simple operation, yet one in my judgement requiring care and skill in order to secure good results, it being the foundation upon which we are to erect our superstructure; for unless we secure a correct impression of the part to be covered by plate, our artificial denture, no matter how skillfully made, and artistically finished, will be worthless for any practical purpose in the mouth. Admitting this to be the case, it is of the greatest importance that a correct beginning should be made. In order to secure good results, the first thing to be considered is the condition of the mouth; if a hard smooth gum exists, or a soft spongy movable one; if a hard or soft palate; if any arch worth of the name, or one running off at an angle of forty-five degrees; in a word, to fully understand the difficulties, if any exist. This observation also determines the material to be used in taking the impression, whether plaster or wax, these being the only substances which can be used with success. The peculiarities of the mouth fully understood and the substance decided upon, the next thing to be considered is the selection of a proper vessel or cup in which to take the impression; this should be in a measure adapted to the mouth, so that no more material need be used than is really necessary, which will avoid crowding the mouth and causing the unpleasantness of an excess of material extending into the fauces; it also lessens the liability to alter, if wax is used in removing it as in the case of teeth remaining or, as is occasionally found teeth upon one side only. The price of the cup should not be

considered, but it be rendered adaptable; our motto being "start right and endeavor to keep so." The cup and material ready—say wax, and the impression an upper one, the patient should be seated in an ordinary chair, the wax evenly softened, and adjusted in the cup as near the shape from observation of the mouth as is attainable by moulding with the fingers. Then holding the cup between the finger and thumb of the one hand, we take our stand at the side of the patient, and with the fore finger of the other press the lip and cheek out of the way and introduce the cup, placing it fairly over the ridge; then with the two first fingers of each hand placed in the bottom of cup, the thumbs resting on the handle to steady it, make firm even pressure until it is brought to the position desired. Holding the cup in place, let the thumbs complete it by pressing the wax well in to the alveolar border; allowing it time to stiffen; then remove it carefully by taking the handle of the cup again between the index finger and thumb, and with the index finger of the other hand raise the cheek so as to put some strain on the muocus membrane covering the ridge, at the same time making gentle pressure on the cup downwards; this will, by admitting air, loosen the impression which should be removed with care. If a plaster impression of the mouth is desired, take the wax impression while it is yet soft and press that portion covering the alveolar border out so as to enlarge the impression a trifle, and with the point of a knife blade prick the whole surface so that the plaster may have more hold on the wax; then with the knife slightly warmed trim off all excess around the border and that portion extending back upon the soft palate. To mix plaster use a weak solution of the sulphate of potash—about one part of the saturated solution to seven of water and of the consistency of cream, pour it quickly about the eighth of an inch thick over the wax impression; then taking a teaspoonful on the point of a spatula, place this in the vault of the mouth, rubbing well over the rugæ with the finger, after which introduce the cup as elsewhere described, with the exception

of bringing up the front a trifle in advance of the heel to prevent air cells. Then let it remain until the plaster will break with a decided fracture, using the same precaution in removing as given for wax. An impression taken in this way, it is believed, will give uniformly better results than where plaster is used alone, the expansion must be less where there is less bulk, and in very deep arches it is more certain to reach all points. What has been said relates of course to upper impressions alone—partial and whole; the same general rules, however, will apply to the lower, both as to adjustment of cups and materials. Having now obtained a perfect impression, it only remains to prepare it for the reception of the plaster which is to constitute the model, this is done by giving the face a thin coat of varnish—I use shellac as evenly put on as possible—and when dry, oil the surface, carefully wiping off all the excess with the brush, when a batter of plaster is mixed and poured into it. While this is being done the impression should be jarred so as to force out all bubbles, which will prevent air cells, making the casts very shallow for reasons given hereafter. The impression when full is inverted upon some plaster previously put upon a piece of glass; and if the case is for a rubber base, I usually extend the cast back so as to afford a base to articulate upon. After the plaster has set, the wax after warming slightly can be pulled off, leaving the thin coat of plaster remain, which will readily scale off by gently tapping over the ridge; this gives us in a rough state the *Model*. As we refer to none of the patented pieces, but an old fashioned swaged base, we shall proceed to prepare this model for making the dies, which is done by shaping it with a knife, so as to slightly taper it from the alveolar border and back part to the base of cast. If for a suction plate, I usually, when the thin coat of plaster admits, prefer cutting the chamber in the impression, but as this can not always be done, as in the case of wax, I take a piece of wax plate slightly warmed and press upon the model, cutting out the size and shape of cavity desired, and pouring in plaster; this, if the cast is moistened, will unite

firmly, doing away with the risk of falling off, when the plaster has set; I then finish off and remove the wax. If for a rimmed plate, I build wax or plaster on the outside of the model to where it is desired the the plate should terminate on the border, and with a knife shape it to any angle desired, and then varnish, and the cast is ready for use. But should the ridge present an acute angle, as in the case of a model prepared for stamping the rim, rendering it difficult to mould, plaster should be run around the border previously oiled up even with the ridge, leaving small points extending up to designate its place in the sand, when it will be found to draw from the matrix without any trouble or injury to the impression. These sections are to be replaced when the precaution is taken to drive off all moisture. The model completed, we now come, in the third place, to consider the manner of constructing and procuring *Metallic Dies*.

Various methods having been adopted, such as first casting dies direct from the impression; second, pouring melted metal in an impression made in sand with the model, and third, immersing the plaster model in molten metal until chilled, being the principal ones, and there being a diversity of opinion existing as to the merits and demerits of each particular plan—all thinking their own the best. I shall, therefore, for brevity sake confine myself to the one long ago adopted, the old fashioned one of moulding in sand, and which uniformly produces as good results as any. The materials and appliances necessary are flasks—sand sieve—ladles—spatula—zinc—tin and lead; the flasks used are the conical shaped *rings* designed by Prof. Austen, five in a nest so arranged as to form a curve when set one on top of the other; these are all that could be desired both as to economy and general application. The materials at hand and the sand dampened sufficiently to remain in shape when compressed by the hand, the shallow plaster cast is placed on a level surface bottom down, and the large ring inverted over it, when sand is sieved and packed around and over the model, squaring off the sand even

with the flask and with the spatula pare away the sand until merely the portion desired is enclosed; tap gently a few times on the cast and hold it in an inverted position so that when it falls out the surface may not be injured; a tap or two on the bottom will complete its removal. We have now a shallow sand impression in which the melted zinc is poured until even with the sand, when the ring next in size is placed fairly on, and pour in the balance. This should be sufficient to give a depth of two inches from the arch; and in pouring the zinc care should be used so that the metal runs around the ridge rising up over the arch, otherwise we may have displacement of the sand and boiling, especially where the plaster sections are used; also in the melting of the zinc, attention should be given so that it is not oxidized but taken just when melted, as this is of great importance in the procuring of perfect dies. After the casting has cooled, part the flask, remove the sand and brush off the casting and coat it with a solution of whiting and alcohol, and again put together the flask with the face of the die up, when it is ready to receive the counter dies, these being made of lead or tin or both combined in certain proportions; for my part I generally make from two to three dies and a counter on each, reserving the best die and tin counter for finishing. This number enables me to swage a plate adapted to all the little inequalities of the mouth; whereas when but one set is used the surface becomes so battered that it can be but a mere approximation. It is the habit of many to trust this part and the getting up of the plate to inexperienced persons, thinking it of little consequence; but it may prove labor lost.

*Swaging Plates.* The dies and counter dies being ready for use, the size and shape of plate may be obtained by lightly swaging a piece of pattern tin foil between the dies and with the point of a knife cutting it to the required shape; then restore it to a smooth surface with the burnisher; then lay the pattern on the plate, and with a pointed instrument mark out the form and with the shears, saw and files cut



out the plate, when it is annealed and then oiled to prevent any metal from adhering to it. With a hard wooden mallet bring the centre of the plate into as good an adaptation to the die as is possible before bringing the edge over the ridge: after this partial adjustment and fitting to the die, wipe off all the oil and anneal the plate and again swage between the die and counter die, repeating the operation and annealing the plate each time until a perfect adaptation is obtained; reserving the best die and tin counter until the plate is trimmed the exact size when a final swage may be given and the plate again annealed, to see that no change has resulted from the application of heat. This is an important precaution, for unless the plate after heating retains its adaptation to the die, it is likely in soldering to warp, when it is too late to remedy it. The plate should now be cleansed when it ready to try in the mouth and obtain the bite.

*Articulating Model.* Under this head we shall include the selection of the teeth, taking the bite and making the articulating model. As the choosing of the teeth is of vast importance to the success of a piece, the dentist should exercise the greatest care in their selection not only as to the color but size and shape, also in view of their arrangement while the patient is present, ascertain to if possible what would prove best to restore harmony and a natural expression. I may here say that at every step in the process of making an artificial denture, we find that mechanical skill—although essential, is not the only qualification or requisite of a dentist, but he should possess ability to combine science with mechanic art. It is important too that he should possess some originality and design and should have made the natural teeth a study in connection with expression and features. The idea that any one, no matter how good a mechanic, can without these essentials engage successfully in the practice of dentistry is a grave error. The plate having been found adapted to the mouth, a rim of wax is placed on the ridge or border as far as the plate extends

and trimmed to represent the fullness and length of the teeth; this is arrived at by frequently trying in the mouth, cutting off or adding thereto as necessary, until desired fullness and length is attained, when a strip of warm wax—sufficient to take impression of the tips of lower teeth, is laid on the rim and the patient directed to bite through, when a knife is used to mark the median line. If for a full denture, the upper may be trimmed as just described and the lower should be placed in the mouth and trimmed off until it gives a natural appearance. Then getting the patient to open and close the mouth as in the act of eating, catch the most natural approximation and mark the median line; this done remove the lower and half imbed a few bird shot in the rim of wax, transferring it again to the mouth and directing the patient to close, thus imbedding the remaining half in the upper wax. The shot serve a double purpose that of a guide, and if the wax is not trimmed correctly, keeps the plate against the ridge by the resistance offered by the wax rims. They may now be removed and joined together ready for the model, which is made by pouring a batter of plaster in the upper side of plate, as described in making plaster casts, and extending back for a base to articulate upon. After the plaster has set, the portion extending behind the plate should have grooves cut to antagonize with; this burnished, and when dry oiled to prevent the plaster from adhering. The whole is then surrounded with paper or putty, and the remaining half poured, after which the model is trimmed and the wax rims removed, when the model is ready for adjusting the teeth.

*Arranging the Teeth &c.* The teeth having been selected for the case—an upper one—we proceed to adjust the central incisors; in arranging these and more particularly the laterals we should remember the patients peculiarities of feature and expression, as well the nature of the ridge and the position of the lower teeth to the same. If the face be thin and the ridge and lower teeth admit, the centrals may with advantage be so set as to form an obtuse angle,

with the laterals slightly inclining to lap over or—as we sometimes find them in the study of the natural teeth—the two centrals on a plane with the laterals, a trifle back, leaving the canines a little prominent. Still another peculiarity with similar features is for the centrals to slightly droop, or to be a sixteenth of an inch longer than the laterals, lengthening at the cuspids. This latter arrangement—taking a side view of the antagonizing edge—gives a curve similar to that of the natural teeth, called a semilunar curve. But should the face be round and full, the laterals should be set up in line with the centrals and be more regular. If the natural antagonism is for the teeth to strike plumb and the patient be advanced in life, the teeth on the cutting edge should be slightly ground off to give them an abraded appearance. The oral arch arranged, the bicusps and molars will naturally find their own position. In grinding the teeth to the plate, it is very necessary to have the joints come fairly together, and every part of the tooth that is possible to be in contact with the plate; this will obviate accidents in soldering and prevent warping, and leave no space for the accumulation of the food. To accomplish this paint should be used to indicate the part to be ground off. The teeth being arranged and articulated, they should be removed one at a time and backed; and as each backing is finished the tooth should be replaced; this will keep them in position in the arch. In finishing the backing and before the tooth is replaced, it should be marked at the base of the tooth as a guide in fitting it to the plate. The backings made and the teeth in position, the piece may be removed from the model and imbedded for soldering. This is done by investing the plate and teeth in plaster and asbestos, equal parts, about half an inch under and around the teeth and plate, and extending an eighth of an inch over the cutting and grinding edges. After sitting the wax or cement—that held the teeth in position—can be removed, and the pins and plate well cleaned; the plate should then be well scraped where the backings meet it, so

that solder will attach itself firmly. When care is taken at this stage of the work, the cracking of the teeth and warping of the plate may, in a great measure, be prevented, especially in fitting the backings so as to have them in actual contact with the plate; also in bending or splitting the pins, no more force should be used than is necessary to hold the backing to the tooth. The borax should be ground to the consistency of cream, and the lining, pins and tooth well coated and then fastened to the tooth by pressing the pins gently together with the pliers. This done, solder—previously coated with borax—may be placed on the pins and backing where it is to be united to the plate, using no more solder than is necessary to unite the same. A piece as long as the width of backing and about 1-16 of an inch wide — if the backing is in contact with the plate—will be found sufficient with a piece about the 1-16 of an inch square to each pin. This, if evenly flowed, will give little trouble in finishing.

*To Solder.* I use a small hand furnace, and igniting well the charcoal, place the piece to be soldered on it and build pieces of coal over it. Let the furnace have an upright position without draft—no more than the perforated bottom gives, and allow the heat to come up gradually until the borax is melted; then flow the solder with the mouth blow pipe, and afterwards cool the piece gradually. After it is cold, remove the investment and place the piece in the sulphuric acid bath to remove the oxide and borax, when it is ready for finishing. In finishing, to remove the excess of solder and pins use small burr wheels attached to the lathe, these are about the size of a three cent piece with file cut edges, and do the work of an hour by hand in a few minutes; then with a stiff brush wheel and oil and tripoli powder remove all traces of file marks. After washing, the plate is burnished and applied to a fine brush wheel—this time using whiting and alcohol, when with a cotton buff wheel the finishing touch is given with rouge and alcohol, and when washed will be found to have a very high polish.

Nothing now remains except to adjust the piece to the mouth.

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### ARTICLE III.

#### *Recent Views on Digestion.*

By J. R. BROMWELL, D. D. S.

Digestion is the starting point of nutrition—as defined by Dr. Dunglison, t'is a function, by means of which alimentary substances, when introduced into the digestive canal, undergo different alternations, the object of which is to convert them into two parts, the one a reparatory juice, destined to renew the perpetual waste occurring in the economy—the other, deprived of its nutritious properties, to be rejected from the body, or, simply a process, by which the food is reduced to a form in which it can be absorbed from the intestinal canal, and taken up by the blood vessels. Animals alone are furnished with a digestive apparatus. All of them, from man down to the Polypus, contain an alimentary canal or cavity variously shaped. We must therefore conclude, that the existence of a digestive apparatus, is an essential characteristic of the animal kingdom. And that food which is intended to nourish the body, must be subject to a digestive process, before it can be absorbed, and carried through the system. In the vegetable world the case is different, then being no necessity for a process of digestion, owing to the fact that vegetables are dependent upon inorganic substances for their nutrition. Carbonic-acid, saline substances and water, being the chief food of the vegetable kingdom. These materials are constantly supplied to the vegetable, in such a form as to be easily absorbed, existing as they do either in a liquid or gaseous form, therefore, requiring no change, or modification before absorption. After absorption, they are converted into other substances, by the process of nutrition.

With man and animals the case is different, the aliments

which nourish them, are obtained, either from the animal or vegetable world, or, as is the case with man, from both. The mineral kingdom furnishes only condiments, medicinal substances, and poisons. Man holds a middle station, between those animals which feed on vegetable and those which feed on animal substances, and he is, therefore, equally fitted for these two kinds of food, being neither herbivorous, nor carnivorous, but in contradistinction is termed omnivorous. The digestive apparatus of the herbivora is more complex than that of the Carnivora, owing to the fact that vegetables are digested with greater difficulty than animal substances. The nutritious matters of vegetables are often present in a solid and unmanageable form, for instance, in common herbs, grass, hay, &c., the digestive matter is so entangled among vegetable cells, fibres &c., and of so small amount, compared to the entire quantity, that a large amount of food must be taken, in order to extract from it the necessary amount of nutritious material, therefore, calling for an extensive and complex digestive process. In such cases, the alimentary canal is long, complex in its structures and functions. In the carnivora the canal is shorter, narrower, and less complicated, the food of such animals being of a softer texture and more easily digested.

With man, though living upon vegetable as well as animal diet, suggesting to us the idea, that his digestive apparatus should resemble to the same extent both the herbivora and the carnivora, it resembles almost exactly that of the carnivora, for most, if not all, of the digestible substances we take as food, are artificially changed and separated from all indigestible impurities, by the process of cooking, and are so softened by the same process, as to be almost, as easily digested as animal substances. Nevertheless, the digestive process of man is still complicated. For as we ascend in the scale of animal existence, we find all the functions of life more complex.

Life is the effect of organization. 'Tis organization in motion. Life is waste, every thought of our life, every

inspiration, every muscular movement, causes the death of some tissue, not the anatomical structures, but the proximate principles, of which they are composed. It has been stated that man wastes daily 1-24 of the weight of his entire body. As this interstitial decay is continually going on, and the body daily, hourly, momentarily wasting, it becomes a matter of critical importance that this waste be supplied, by the formation of new tissue, and it remains for the process of nutrition to supply it. When there is a demand for nutrition, greater than the blood can supply, hunger and appetite may be considered as parts of digestion. In regard to the cause of hunger, many different theories have been propounded, the following, are regarded to be correct. The sensation of hunger, although referred to the stomach, is governed by the system at large, for in proportion as the nutritive material, or property of the blood is sufficient, or inadequate to supply the waste of tissue, so is the sensation of hunger increased or diminished, the want of food being the primary not the proximate cause of hunger, proximate cause of hunger being the waste of tissue and the demand for separation. The sensation of hunger is more keenly felt in the young than in the old, owing to the fact that the constructive and destructive arrangements of the young are more active than those of the old, and again, the mind being free from anxiety and not directed towards other objects, takes notice of the sense of hunger at once. Excessive grief and moral emotion deprives us of appetite. Every one is acquainted with the facts, that when laboring under intense mental excitement we have but very little desire for food; the mind being directed in another channel fails to take cognizance of the sensation of hunger, and was it not for the great lassitude and faintness produced by abstinence from food, a person burdened with any great trouble might go for an indefinite period of time without feeling the sensation of hunger, or the slightest desire for food. The effects of protracted abstinence from food are a diminution of the weight of the body, which becomes sensible in the course of twenty

four hours, a waste of the body from the loss of fat, discoloration of the fluids—especially the blood, loss of strength, excessive sensibility, sleeplessness, with painful sensations in the epigastric region. Death from inanition is most easily brought on in the young. Thus the unfortunate father, whose horrid story related by Dante, condemned to die of hunger, and shut up with his children in a dark dungeon, died the last on the eighth day, after having witnessed in the convulsions of rage and despair, the death of his four sons, unhappy victims of the most execrable vengeance ever recorded in the history of man. There are many marvellous, and if I may be pardoned for saying so, ridiculous accounts on record in regard to the length of time a man may go without food of any kind. Haller, in his work on Physiology, gives an account of a person who went as long as eight years without any food. The average length of time, for a person to go without food, is from five to eight days.

The 10th pair. of nerves, convey the impression of hunger to the brain. The impression of hunger is to the stomach, as the sensation of sleep is to the eyes. Man requires 1-23 of his weight in daily food, to supply the waste of tissue, continually going in his body; if the waste is greater than the repair, we ultimately have death. Hunger kills by a putrid fever; thirst by an inflammatory one. The sensations of thirst seem to be very analagous to those of hunger, but, the seat of sensation of thirst is in the fauces, not in the stomach. The proximate cause of thirst is the demand from the system caused by the discharge of water by the skin, kidneys &c. Primitive cause, sensation in the throat. Thirst is in direct ratio to the waste going in the tissues, being increased by high temperatures and loss of blood, also by various kinds of food and drink, for instance salted and highly flavored or seasoned meats, alcoholic and all stimulating drinks, salt producing thirst by the attraction of water from the blood by the process of endosmoses. It is increased in proportion to the increase of the secretions



and excretions. In diabetes for instance it is excessive. The calls of thirst are more absolute than those of hunger, and are much less patiently endured. Every one who has witnessed the scene of a battle field after an engagement, will remember the calls of the dying and wounded for water. A drink of cold water to a man suffering from thirst increases his thirst by acting on the coats of the stomach as a stimulant, thereby increasing the flow of blood to the part, and immediately absorbing the water. For fluids taken into the stomach are not subjected to a process of digestion, but are absorbed at once. Tepid drinks are better than cold to satisfy thirst, ice better than water. Three to four days, is the limit of endurance from water, given by most modern physiologists. If the calls of thirst are not satisfied, the blood and the fluids which are formed from it become more and more stimulating, from the concentration of saline substances which they contain. The general irritation gives rise to acute fever, with heat and parching of the fauces, which inflame and may become gangrenous, as happens in the case of hydrophobia. Water constitutes 75 per cent of the human body, and as it is not only given off by the excretions and secretions, but by the waste of tissues also, it is very important that this waste be supplied, showing the necessity, of the free use of cooling drinks in nearly if not all forms of disease. Many a man has languished and died when his life might have been saved by water.

In the foregoing remarks I have endeavored to show the necessity of food and water, not only to the health but to the life of the animal economy.

We now come to the various functions of digestion. In man, the digestive apparatus consists of a tube or canal extending from the mouth to the anus, called the alimentary canal. This canal is separated into various cavities or compartments, communicating with each other by means of narrow orifices. Into these cavities empty the different digestive fluids secreted by the mucous membrane lining the inner surface of the canal, and by the neighboring glandu-

lar structures. First we have the cavity of the mouth, communicating with the stomach by the pharynx and œsophagus. Second, the stomach opening into the small intestine by means of the pyloric orifice. Third, the small intestine having the names of duodenum, jejunum and ilium. Fourth, and finally, the large intestine separated from the former by the ileo-coecal valve, and terminating at its lower extremity by the anus guarded by a double sphincter. The alimentary canal is composed of a mucous membrane, an intermediate coat composed of sub-mucous areola-tissue, and a muscular coat. The mucous membrane presents a different structure, and has different properties in different parts of the canal. In the cavity of the mouth, pharynx and œsophagus, it is smooth, with hard, tessellated epithelium. In the stomach this membrane, a continuation of that of the œsophagus, is soft and thick and of a light pink color, it is thrown into a number of folds or rugæ, the epithelium is thinner than that of the œsophagus, and is of the columnar variety. In the small intestine the membrane is covered, with columnar epithelium and longer than in any other coat. It is thrown into numerous transverse folds, called valvular conniventes; its surface is covered by a number of projections call villi, and it contains a variety of peculiar glandular structures. In the large intestine, the membrane is again different, here it is smooth and shining, free from villousities, and has a different glandular structure. The intermediate or cellular coat attaches the mucous to the muscular coat, and serves for the passage of vessels and nerves. The muscular coat is formed throughout its entire length by two layers of fibres, one longitudinal, the other transverse. The alternate contraction, and relaxation of these two sets of fibres produce the peristaltic or vermicular motion, by means of which the food is carried through the canal from above downwards. The will directs, to a certain extent, the motion of its two extremities, while the motion of the rest of the canal, is involuntary. The digestive fluids are also different in different parts of the canal

The food as it passes down the canal meets with no less than five different digestive fluids. First, the saliva, second, gastric juice, third, bile, fourth, pancreatic, fifth, the intestinal juice. Digestion is accomplished throughout the entire canal, by the action of these five different fluids, the various materials of food, are successively reduced to a fluid, transformed and taken up by the absorbent glands, of the mucous membrane of the small intestine.

Digestion is divided into the subordinate functions, of Prehension, Mastication, Insalivation, Deglutition, Gastric digestion, Intestinal digestion, and Defecation.

- Prehension is the act of laying hold of, or seizing the food.
- Mastication is the process, by means of which the food is bruised, ground or triturated, so that it may be readily acted upon by the digestive fluids. It is of great importance to the perfect digestion of food, owing to the fact, that as the action of the digestive fluid is purely chemical in its nature, the food will be more readily acted upon by being thoroughly comminuted than if brought into contact with the fluids in a solid form. In the chemical process of subjecting any body to the solvent action of any fluid, it is always more readily acted upon by being broken into small pieces, presenting a large surface to the contact of the fluid. If mastication is imperfectly effected the subsequent processes of digestion are liable to be deranged. This derangement is continually met with, for there is not, perhaps, a more frequent cause for dyspepsia than imperfect mastication, whether caused by the haste with which the food is swallowed or by the want of proper instruments. The main reason for so many diseases (with man) of the digestive process, is the diseased condition of the mouth and teeth. For food to be digested properly, must be thoroughly mixed with saliva, and this cannot be done unless well masticated. Food that has been imperfectly masticated, will be imperfectly digested. Mastication must, therefore, be considered as one of the most important features of digestion. During the mastication of food it is mixed with the first of the

digestive fluids, viz. the saliva. Human saliva, as obtained directly from the cavity of the mouth, is a colorless, slightly viscid, and alkaline fluid, with a specific gravity of 1005. Bidder and Schmidt give the following analysis of saliva.

|                                               |        |
|-----------------------------------------------|--------|
| Water, . . . . .                              | 995.16 |
| Organic Matter, . . . . .                     | 1.34   |
| Sulph. Cyanide of Potassa, . . . . .          | 0.06   |
| Phosphates of Soda Lime and Magnesia. . . . . | .98    |
| Chlorides of Sodium and Potassium, . . . . .  | .84    |
| Mixture of Epethelium, . . . . .              | 1.62   |

|       |         |
|-------|---------|
| Total | 1000.00 |
|-------|---------|

The organic substance found in the saliva, is known by the name of Ptyaline. There is a small amount of albumen also present mixed with the ptyaline. The reaction of saliva in a normal condition is decidedly alkaline. Nevertheless, it varies during the day, being at times decidedly acid, this is thought to be owing to the excessive secretion of mucous, the reaction of which is acid. In regard to the quantity of saliva secreted daily, it is almost impossible to form a correct estimate, owing to the fact that the salivary secretions, are by no means constant, being almost, if not entirely, suspended by cessation of the muscles of mastication and the tongue, unless excited by the artificial stimulus of food or some foreign body. Hence it follows, that during sleep, if the mouth be kept open, it become dry because the secretions are checked. The saliva flows readily under the stimulus of food, it is in act proportion to its hardness, or dryness, when dry and hard, therefore, requiring much mastication, then is excessive secretion of saliva. Where soft and moist, a small quantity of saliva is poured out.

Fluids do not excite the secretion of saliva, but pass at once into the stomach. The parotid gland is the principle one, in the secretion of saliva, it assists in mastication. The sub-maxillary, and sub-lingual assists in digestion. The true function of the saliva is purely mechanical. Its action is to moisten the food, and assist in mastication and degluti-

tion. The saliva has also the property of converting, by a catalytic action, starch into a sugar. This property of saliva is owing to its organic principal ptyaline, which was discovered by Leuchs of Germany. It was formerly believed that all amylaceous substances, were partially, if not wholly, digested in the mouth by the action of the saliva. The present theory in regard to digestion proves the fallacy of the above, owing to the fact that food does not remain long enough in the mouth to be digested, but passes at once, after mastication into the stomach, and also, that the digestion of starch, is accomplished in other parts of the canal to be spoken of hereafter. The action of saliva is therefore simply a physical one.

*(To be continued.)*

## SELECTED ARTICLES.

### ARTICLE IV.

#### *On the use of Chloroform in Infantile Convulsions.*

By DAVID MACKINTOSH, M. D., L.R.C.S. EDIN.,

Late President of the Hamilton (Ontario) Medical and Surgical Society, and one of the Physicians to the Hamilton City Hospital.

(A paper read before the Canadian Medical Association at its meeting held in Toronto on the 8th September, 1869.)

To be awake during the night to find a child, who had gone to bed apparently in the best of health, racked with convulsions and distorted by spasms, or during the day to observe a child who has been running about, in all the joy and buoyancy of youth, and in the very flush of health, suddenly fall, become unconscious, and in an instant be disfigured with the twitchings or the powerful contractions peculiar to convulsions, is one of the most painful and startling positions in which a parent can be placed, and in which, almost more than any other, he looks to the medical man for help. To be summoned to such a case, and to be able to do little or nothing likely to give certain relief, where so much is expected of him, is one of the most trying positions in which a Physician can be placed.

Every member of our Profession must be aware that in such a case he has to stand idly by, till, the source of irritation having been removed by the efforts of nature, the patient rallies, or till the exhausted frame sinks under the strain on the nervous system, and death comes to the relief of the little sufferer, or make use of remedies in which he has little faith, and which are mostly employed from a conviction that *something* must be done to satisfy the relatives of the patient, however small the prospect of doing good.

In such cases the difficulty is not so much the want of remedies calculated to give relief as the impossibility of administering them in the ordinary manner, since all the avenues usually employed for the introduction of these remedies into the system are closed, the jaw is locked, and the power of deglutition gone, and the anus is relaxed, and thus unable to retain enemata.

In such cases the practice generally has been to plunge the patient into a warm bath, while the head is kept cool with ice or vinegar and water or the cold water douche, to apply sinapism or some other rapid and powerful counter-irritant to the lower part of the body, administer, or attempt to administer, enemata, either with the view of working out the irritating matter from the primæ viæ, or to act as antispasmodics, and in some cases, (*and that more to have the appearance of not being idle*) to apply leches.

If, however, we look at the rationale of the cause of such convulsions in most cases (and let it be distinctly understood that this paper refers to convulsions arising primarily either from the irritation of teething or from the presence of indigestible substances in the stomach or bowels and not to convulsions caused by disease of the nervous centres) if, I say, we look at the explanation of such cases we will see that most of these modes of procedure are either injurious or altogether useless.

Take, for instance, a case of convulsions arising from the irritation of teething, we find that the presence of the advancing teeth stretch the resisting gums and irritate the

delicate nervous fibres, and thus in all cases causes a great amount of irritability, and, in very susceptible constitutions, this irritation being conveyed to the centre of the excito-motary system, causes, by reflex action, irritation of the motary nerves, the visible evidence of which we have in alternate contraction and relaxation, of the parts supplied by these nerves, termed spasms or convulsions according to their extent or duration.

On the other hand take a case of convulsions arising from the presence of indigestible matter in the primæ viæ, we have direct irritation on the organic nerves which like a delicate net work cover the intestines—this irritation passing along the large ganglia, to the excito-motary system, and producing, by reflex action, the convulsions and spasms already referred to.

In both instances, of course, the removal of the source of irritation must be a primary object, and where this can be done quickly and thoroughly at the very commencement of the spasms, and that more especially in some children (who not having those finely strung nerves which seem to be peculiar to certain families, and which render them subject to convulsions, from very slight sources of irritation) the disease is very often checked at once and the patient cured. Thus, for instance, in convulsions from teething, timely scarification of the gums will often stop the spasms, while in cases of convulsions from irritation of the bowels, if the first attack be slight, and we have time for the administration and action of drugs calculated to clear out the primæ viæ, before a recurrence of the muscular contractions, we may often relieve the patient. But how frequently does it happen in these cases, and more especially in those that prove fatal, that the jaw remains locked and the power of deglutition gone, preventing on the one hand the use of the scarifying lancet, and on the other the administration of suitable remedies, thus leaving us almost powerless for relief to our patient.

Besides which we must bear in mind the impossibility

of prognosticating the result in any case of convulsions ; for once these spasms have begun, who can tell where they will stop ? In many cases the nerves once put to their utmost tension seem to keep up their irritability, and are ready to start the muscular contractions from the slightest source of irritation either external or internal. In such cases the usual remedies or appliances are really of very little service, and after repeated attacks the patient dies exhausted, unless speedily relieved.

But what will be said of those cases in which little or no interval to the spasms ever takes place, and the patient dies utterly exhausted without the slightest remission in the distressing symptoms ?

In such cases the attempt to administer remedies by the mouth is utterly futile, and from observation of a number of such cases it has appeared to me that any movement of the patient has acted as an additional source of irritation, and that counter-irritation, and even leeching, have produced the same effect. And indeed when we take into account the intensely susceptible state of the nervous system which, in such cases, may be compared to a cord stretched to its utmost capacity and ready to snap by the slightest touch, we cannot wonder that any irritation, even the very slightest, is injurious.

In such instances, almost the only avenue of communication, so to speak, with the interior of the system is through the action of respiration.

If, then, we have a remedy which is powerful sedative of the excito-motary nerves, and which can be safely introduced into the system by means of inhalation, and if such a remedy is had recourse to, before the body is completely exhausted, we at once control the nervous twitching or more severe convulsions and thus give time for throwing off the source of irritation, or we ally the induced over-excitability of the nervous system, and give time for the calming down of the tumult produced.

Such a remedy, I believe, exists ready to our hands in the shape of chloroform, administered by inhalation.



But, without any further preface, let me relate five cases in support of this view: J. R., a boy aged seven months, with a large and very irregular head, child of a very scrofulous mother but a healthy father, had several slight attacks, marked by fixing of the eyes producing the appearance of a continued stare, was seen by me in July, 1859, for convulsions in the form of twitchings, confined at first to the muscles of the face but latterly to both arms. When I first saw the patient he was slightly flushed in the face and the twitchings about the mouth were frequent. His eyes were fixed. He had cut no teeth, but the gums were hot, swollen and dry. The pulse was small and irritable and almost past being counted—fully two hundred a minute. The bowels were also in an irritable state; motions frequent, green and slimy.

The gums were freely cut and remedies administered to relieve the irritation of the bowels as well as of the system. These were accompanied by synapisms to the abdomen. These remedies were continued for three days, during which time the child had several attacks daily, each attack increasing in duration and intensity, and the spasms frequently extending to one or both arms, and this although the gums were repeatedly lanced and although the intestinal irritation had wholly disappeared. On the fourth day the anxiety of the parents was very great, and I was abjured by them to do something for the relief of their boy, (whom by this time they had given up as lost) even if it afforded no prospects of a cure.

Having seen, some months before, a case, reported by Sir James Simpson of Edinburgh to the Obstetrical Society there, in which he had kept a child for nearly a week under the influence of chloroform, allowing it only to awake occasionally for the purpose of having it fed, and which resulted in the complete recovery of the child, I had no hesitation in recommending the administration of chloroform by inhalation in the case of J. R. The parents, anxious to see their child relieved of the spasms, at almost any risk, consented.

After a few inhalations the spasms and twitchings gradually subsided, and in five minutes they had completely disappeared and the child had the appearance of being in a quiet slumber. This was about two o'clock in the afternoon, the child awoke about four, sucked readily, and remained free from spasms until next morning, when it had a recurrence of them, but this time not so severe. The child had a return of the spasms three or four times every twenty-four hours for four days. Each time they were stopped by the inhalation of chloroform, and they gradually diminished in intensity and duration till the last one on the fourth day was merely a slight twitching about the mouth and turning up of the eyes, after which the spasms completely disappeared.

After the second administration of the remedy I instructed the father, who was a very intelligent man, how to give it himself, and he continued to do so during the rest of the time, I seeing the child twice daily. In all, the child took about two ounces of chloroform. This family remained under my care for three month, during which time the child continued well and cut several teeth.

#### CASE No. 2.

E. Allen, a girl, aged four years, apparently healthy, although both father and mother look delicate. She never had an attack of convulsions till the present, which took place during the night of the 23rd July 1861. She had been at a Sabbath school pic-nic on the 22nd, which was a very hot day, was exposed a good deal to the sun, and had partaken freely of half-cooked cakes with dried currants. Her mother was awoke about one in the morning by a peculiar noise and found her child in convulsion; the right side of the face, and the arm and leg of the same side being most affected. In about an hour I saw the patient, she had vomited a little of the cakes and dried fruit, and had had two copious and very fetid alvine evacuations. She had been put into a warm bath. This was repeated with the application of cold to the head, a copious enema,

which, however, was not retained any time, administered, synapisms applied to the abdomen, but with no relief to the symptoms. Indeed they rather appeared to increase in intensity. All this time there was powerful closing of the jaws, and no indication of swallowing when liquids were put into the mouth. The pulse was past being counted.

Not having the chloroform with me I despatched the father for it, and in about an hour and a-half from the time she was discovered in the fit began its administration, by inhalation. In ten minutes the spasms had entirely ceased and the child appeared to be in a natural slumber. The remedy was administered twice in the next hour on her appearing to awake. I remained with her two hours longer, and left her in a sound sleep, from which I learned that she awoke about eight o'clock refreshed and ready for her breakfast. During my forenoon visitation I called and found her playing about the house with no trace of the severe ordeal to which her system has been subjected during the night. She had no other remedy, yet she continued well, and I saw her the other day, a stout healthy girl.

#### CASE No. 3.

A. Notz, a large, flabby-looking girl of three and a-half years, had twice been attended by me during teething for attacks of convulsions, accompanied by gastric derangement. These attacks were slight and she recovered each time in two or three days.

July 27th, 1862—I was called to her about eight in the evening. She had been at a friend's house all day and had eaten a considerable number of unripe plums. She came home complaining only of a little sickness at stomach, was put to bed about seven o'clock and awoke vomiting, and was quickly seized with convulsions. The symptoms were much the same as in the last case, besides which, the evacuations, which were also very offensive, contained what her father called *a hat full* of half digested unripe plums. The jaws were also set and deglutition impossible. Before my arrival she had been put into a hot bath. There was no

abatement of the spasms until she was brought fully under the influence of chloroform, which I carried with me in this instance, as I had come to consider it a valuable remedy. After she had been brought fully under its influence the inhalation was stopped, and not resumed again till she was allowed to awake, which she did in half an hour, apparently well. In few minutes, however, the spasms returned, but were immediately checked by the remedy. This was repeated frequently during the next four hours, and at two in the morning I left her in a natural slumber into which she had lapsed from the anaesthesia, and from which she awoke about her usual time in the morning, almost well, but suffering from great lassitude and prostration. This continued for several days with slight febrile attacks. These were treated with alteratives and tonics, and in a few days she was well. She has had two attacks of febris infantum remittens since, but no return of the convulsions.

#### CASE No. 4.

E. T., aged three years and two months, was in the garden playing with other children on Oct. 8th, 1862, till about four P. M., when she came into the house in a stupid like state, and it was thought that she must have fallen from a low branch of a tree on which she had been put by one of her brothers. I saw her in less than five minutes, when she seemed to be getting more sensible, but was still unable to speak. When asked what ailed her she put her hand to her head. She could not be got to swallow, and as she seemed improving I told them to watch her. In about a half an hour, and without her becoming quite conscious or able to speak, she was seized with twitchings of the facial muscles and fixing of the eyes and jaws. There was also clenching of the fists with inversion of the thumbs; she had had a slight alvine evacuation but it was not fetid. Pulse quick.

I at once administered chloroform in the usual way, and kept it up for about two hours. The spasms yielded to the

remedy at once, but recurred slightly when it was discontinued long.

At the end of the time mentioned she had lapsed into a natural slumber, which continued all night and from which she awoke apparently well. Next day she went about the house as usual, and was only restrained, by the anxiety of of her parents, from entering into the ordinary excitements of a playful girl of her age. She has had whooping cough since, but no return of the convulsions.

CASE No. 5.

On 29th April last I delivered Mrs. Jones of her first child, a female, by the aid of instruments, having first administered chloroform. The child was small, but thrived well till June 13th, when, without any apparent cause, it was seized with fixing of the eyes and twitchings of the face. I saw it soon after, and while there it had a fierce convulsive attack. The child being only seven weeks old, and I never having heard of the administration of chloroform to so young a subject, at first hesitated, but as the convulsions were very severe and recurred so rapidly as to prevent the administration of medicines or nutriment, I was forced to the alternative, and administered chloroform inhalations very cautiously, and was delighted to find that, although it did not control the convulsions so rapidly nor for such a length of time as in the other cases, still it gave sufficient space between the paroxysms to admit of the administration of food and medicines, and for two days the child continued almost free from convulsions. On the following night, however, I was summoned again, the convulsions having set in with renewed severity. Chloroform was again administered with good effect; but it was now evident that head symptoms had supervened, and I cast about me for another remedy with which to combat these, the chloroform being still continued at intervals to check the spasms. It must be confessed that I was somewhat at sea as to the proper dose of the bromide of potassium for so tender an age as seven weeks, and thought it best to begin cautiously, with

three grains in simple solution. The effect being beneficial the dose was gradually increased every two hours, till six and ultimately ten grains were reached. The convulsions ceased in the two days, but the child lapsed gradually into a semi-comatose condition, from which it recovered in a few days to reveal the mortifying fact that total blindness had supervened. Counter irritation to the scalp, by means of croton oil, as recommended in a recent number of *Edinburgh Medical and Surgical Journal*, had the most happy effect in removing the blindness, and the child was soon restored to the use of all its faculties, the only disagreeable symptoms remaining being a double strabismus. A few days ago I saw the child, and it looked intelligent, plump and healthy.

#### REMARKS.

In remarking on these cases I may say that they represent very well the class of cases of greatest severity which occur to medical men in their practice among children, and I have little doubt that but for the administration of the chloroform one or more of them would have proved fatal. This I say from my recollection of many cases seen during a connection of over a quarter of a century with the Medical Profession. Taking a retrospective glance in to that period the mind reverts with painful interest to several cases of convulsions in children, suddenly supervening after some error of diet, either in quantity, or during the period of teething, without any organic completion, and resembling in their mode of attacks, one or other of the five successful cases given above, so closely as to bring conviction to my mind that had we known the mode of treatment specified, a cure would have been the result in all or nearly all.

#### MODUS OPERANDI.

As to the *modus operandi* I have already stated my belief that, in cases such as are given above—and I believe that they are the only class of cases in which we may look for success from this mode of treatment—the remedy acts by keeping the nervous system, and more especially the

spinal portion, in a quiescent or even torpid state till such time as the irritation shall have passed away, and the system is left in something like its normal condition to resume its functions.

M. Billard has shown that affections of the spinal cord are more frequent in young children than those of the brain; and M. Olivier states that the symptoms of the former are much better marked than those of the latter, and I look upon these convulsions as being entirely connected with derangement of the functions of the spinal marrow, and being the manifestation of reflex action produced by indirect irritation of the excito-motary system, and this view is, I believe, upheld by the action of chloroform in the cases above noted, as, had they been primarily connected with derangement of the sensorium, they would have shown different results.

#### UNSUCCESSFUL CASES.

It will naturally be asked is there no dark side to this picture, no record of unsuccessful cases to be related which might shake one's faith in the potency of this remedy in convulsions. In answer I say that, in all kindred cases in which I administered chloroform, it has been invariably successful, and in only one case was it given unsuccessfully, and that, as was anticipated, proved fatal. During the time over which those cases spread I have seen frequent cases of convulsions in children, but they were either so slight and transient that they required little or no treatment, or they depend on organic disease of the brain and were not adapted for the remedy, so that it was not considered proper to try it except in the one case, which I will now briefly relate.

#### CASE 6.

E. M., a delicate girl of eleven years, was also at the Sabbath School pic-nic which we have mentioned in case No. 2. The day was sultry and the heat very powerful. Unlike the child Allen, she had fastened all day with exception of large drafts of water. Indeed, she was probably

ill before going to the pic-nic, and on coming home took to her bed, complaining of headache, accompanied with chills, followed by fever. An officious neighbor pronounced it ague, and the poor child was dosed with quinine for a week, during which time the symptoms continued to increase in urgency, owing, accordingly to the aforesaid neighbor, to the doses of the bitter being too small. These were increased with no better results, and about the end of the week when I was called in, she was in the last stages of Hydrocephalus, como and convulsions being present. The convulsions were so distressing to the parents that they begged of me to give her something to allay them. I told them that there was no hope of her recovery, and that the only remedy I knew of as likely to stop the spasms was chloroform, inhaled. They consented to its administration, and, merely with a view of relieving suffering and not with any hope of cure, it was given. The spasms were held in check while the patient was under the influence of the drug, but recurred with equal violence when it ceased to act. For two days she lingered in this way, gradually getting weaker, till death supervened.

I believe in this case the chloroform did no harm, and it certainly seemed to relieve the patient's sufferings; at all events, the feelings of the parents and friends were spared the witnessing of the distressing spasms. Of course this case cannot be brought forward against the use of chloroform in cases such as this paper refers to.

Since the commencement of this treatment I have notes of other twenty-two similar cases, treated in the same way, and invariably with success. I may mention that I always give the chloroform by means of a thin handkerchief or towel folded up so as to form a hollow cone in the hand.

I have since used it *guttatim*, after the method introduced by Dr. Moir of Edingurgh, as related by Sir James Simpson in the Edingurgh *Medical Journal* for 1863, and since simplified and rendered more certain by Dr. A. M. Rose-



burgh, viz.: that of covering the face with a single fold of a towel and dropping the anæsthetic on it very slowly.

In conclusion I would strongly recommend the treatment of convulsions of this class by chloroform inhalation, and will be glad to get the views of my medical brethren on the subject.—*Canada Medical Journal.*

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## ARTICLE V.

### *Irregularities of the Teeth.*

By H. D. ROSS, D.D.S., QUEBEC.

Read before the Dental Association of the Province of Quebec.

There is, I think, no specialty of our profession which calls forth greater efforts of ingenuity, knowledge of the anatomical arrangement, not only of the teeth themselves but also of the contiguous parts, physiological knowledge, including temperament, the theory of absorption, ossific changes, etc., and a correct idea of expression, than does the treatment of irregularity. There is, also, I may safely say, no department of dentistry which requires more patient, untiring perseverance, not only on the part of the operator but also that of the child—and before undertaking a difficult case it is well to understand thoroughly the disposition of the little patient, and to be tolerably well assured in your own mind that the child is possessed of sufficient determination and perseverance, to patiently aid you through the difficulties to be encountered in the treatment of the case.

In the few remarks which time permits of this evening, I shall confine myself more particularly to the anatomical and physiological changes which occur in altering the position of a tooth. The mechanical treatment of these cases is so varied—almost every fresh one requiring some particular modification to suit its peculiarities, and as we have so many excellent descriptions and plates illustrating the various methods of reducing irregularity, both in our text books and in the several journals devoted to our profession, with which we are all conversant, that it will be unnecessary to

occupy your time with what would be merely a recapitulation of what we have already read and studied.

Let us suppose a simple case of irregularity, in which one or both the superior central incisors have taken an abnormal position anteriorly to the other teeth. The first question which would present itself to our minds would be, is this irregularity of the incisors an hereditary peculiarity, or is it the result of the operation of some mechanical cause. If the arrangement be hereditary the difficulty of correcting it is very much greater than if it were created by any of the mechanical causes which so often make the trouble; such, for instance, as the premature extraction of the deciduous teeth, or, on the other hand, the obstruction caused by the non-absorption of the roots of the milk teeth, or, as is not uncommon, by the habit acquired by some children of sleeping with a finger or thumb in the mouth, and resting on or pressing against the front teeth.; crowding of the teeth, owing to a want of proportion between the maxilla and that of the teeth themselves, or any of the other causes which come under this heading. The difficulty in hereditary cases of irregularity is not so much the mere moving of the teeth to their proper places in the arch, as the retaining them there once they have been drawn into their places, and unless the teeth are kept for a length of time in the desired positions, so as to allow of a firm deposit of new bone around their fangs, they will most assuredly return gradually to the direction taken by them on their eruption through the gum.

I have at present under treatment a case of hereditary irregularity in which, when first brought before my notice, the six front upper teeth projected a considerable distance beyond the corresponding lower ones, the central incisors of the upper jaw being a full inch in advance of the lower teeth when the mouth was closed. This case is rendered the more difficult in consequence of the great prominence of, and strongly pronounced alveoli corresponding in direction with that of the teeth themselves, and the malformation is

rendered the more apparent in consequence of the comparative shortness of the lower jaw. In connection with this case there is a curious complication which at first I felt afraid would defeat all attempts at drawing the teeth back and into a regular arch. This difficulty arose from the left superior central incisor having, about two years before, been knocked entirely out of its socket by a fall. The unfortunate central was lost and not recovered till about an hour after the accident, than the doctor was sent for, who, on his arrival, washed the tooth and replaced it, fastening it to the others with thread, and strange to say, after a short time it united firmly with its socket. The most curious part, however, of the case is that my friend the doctor succeeded in fastening it so tight that I have never been able, with all the power that I could get on it with elastic bands, to loosen it the least. We are all aware that in moving a tooth in the mouth a certain amount of looseness and tenderness is the invariable results, but this case is an exception. The tooth has indeed been moved back, but in moving it has brought the anterior part of the jaw with it. Thus, what at first I was inclined to consider a great difficulty, has turned out a sort of negative evil, as the tooth has acted as a kind of lever in drawing inwards the prominent alveolar process of the anterior part of the superior maxillary which was at first so unsightly.

To the best of my recollection, this is the first case reported of so singular a complication of irregularity, for though we have frequently heard of and occasionally seen cases in which teeth have been knocked out and drawn from their sockets, and being afterwards replaced have become tolerably firm, I do not remember having heard of any case in which the displaced and restored organ became, as has the one in question, the most firmly seated tooth in the head, and decidedly as healthy in every way as any of the others. It would be out of place here, and foreign to the subject of this paper to express any opinion on the subject of the physiological forces employed by nature in the reinstating of

this tooth so firmly in its place, its connection with the system evidently as perfect as ever; its unchanged color and sensitiveness on the application of extreme cold, evincing the perfect preservation of its pulp, and consequently the reunion of the nerve filament at the apex of its root with that in the base of its socket; and the very dense formation of ossific matter which must have taken place around the root. All these phenomena could be made the base of many interesting discussions, but as I have already occupied too much time in introducing this matter here we will return to the proper subject.

The first effect of pressure applied to a tooth for a given time, is to produce an enlargement of its socket, or in other words the socket being composed of porous and slightly elastic bone, the traction exerted by the appliance brought to bear on the irregular tooth causes the socket to stretch or widen in the direction of the applied force. This is the first or mechanical effect. Soon after, however, another and very beautiful physiological process is brought into operation, namely, absorption. It is an established fact that gentle pressure steadily maintained for a given time on bone will produce gradual absorption of the part so pressed against. It is this process of absorption of which we avail ourselves in the treatment of irregularity, and were it not for this stimulated action of the absorbents in removing little by little, portions of the inner or outer alveolar plate as the case may require, all efforts of dental skill would be unavailing, and the successful treatment of orthodontia become an impossibility.

There is yet another important physiological action brought into play by this change in the position of the tooth, namely, the deposit of new bone around that part of the root which from having been moved is left unsupported. The irritation caused by moving the tooth excites the alveolo-dental periosteum and surrounding tissues, and induces an increased flow of blood to these parts, occasioning a species of hyper-nutrition, which process continues till no longer

required; cell by cell the process of building up new alveolar support around the moved and loosened teeth goes on till they become firmly implanted in the newly acquired position. In the treatment of these cases, and more particularly those in which the objectionable position of the teeth is inherited, too much care cannot be taken to preserve the teeth steadily for a considerable length of time in the desired places. If the use of the plate or other appliance which may be employed to retain the teeth in the acquired situation, be discontinued too soon, the teeth will gradually work back again to their old places. On this object Mr. Tomes remarks, "It would appear as if there was a natural law tending towards the maintenance of a conformation, when once assumed although an irregular one, and which calls into action the reproduction of a lost part more rapidly in the place in which a tooth has been moved from, than into which it has been moved." The truth of this must be apparent to every dentist of a few years experience, for we have all seen cases in which irregular and very prominent teeth have been brought into position, and which have a few years afterwards apparently become almost as irregular as ever. The cause of failure being, no doubt, the want of proper artificial support for a length of time sufficient to allow of the perfect building up of the new alveolar wall or socket around the roots. On this subject permit me to make another short extract from that part of Mr. Tomes' excellent work on dental surgery, which treats of irregularity, he says: "I believe it is in accordance with the experience of those who have devoted their attention to the treatment of irregularities, that where the front teeth have been brought in by mechanical means, and where mechanical means are required to hold them in place until they become permanently fixed, the treatment must be continued for twelve months. It may not be necessary that the apparatus should be constantly worn for the whole period, but it cannot be wholly thrown aside. Towards the latter part of the time it may be worn occasionally only, but even

after the lapse of twelve months, should the teeth show any indication of moving from the desired position, mechanical restraint must be resumed."—*Canada Journal of Dental Science*.

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## MONTHLY SUMMARY.

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*Hydrate of Chloral*.—Prof. W. A. Hammond, in a very interesting communication, says the first effect of hydrate of chloral is to cause congestion of the cerebral blood-vessels, and subsequently induce the very opposite condition. Small doses produce the first, large doses the latter state. A strong man with acute mania, quiet and not very irrational at the time got five grains hypodermically. He very soon became furiously excited, broke away from his attendants, rushed into the street, ran nearly a mile, and remained highly maniacal for several hours. The next day he had twenty grains hypodermically. He fell asleep in forty minutes after, and slept for ten hours. He had not previously slept for eleven days. He awoke free from delusions, and altogether better than he had been for several weeks. Forty grains of hydrate of chloral were administered to a gentleman suffering from cerebral hyperæmia and wakefulness, who had slept none the night before, and only about two hours a night for several weeks. In half an hour he was asleep and slept soundly for nearly twelve hours. Other cases almost similar in character and results are given.—*New York Medical Journal*.

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*Death from Chloroform. Fatal Tooth Pulling*.—Mrs. Bradford Foote of Sheffield died from the effects of chloroform in the office of Dr. W. W. Rice, in Great Barrington, Mass., Saturday afternoon. Mrs. Foote called at the office to have a number of teeth extracted, and requested Dr. Rice to administer chloroform. He reluctantly consented to do so, as Mrs. Foote did not appear in perfect health. The chloroform was given by Dr. W. H. Parks, who was called in for that purpose. Twelve teeth were extracted, and Mrs. Foote had partly recovered consciousness, when she suddenly seemed to choke, and died in a few moments.—*Boston Herald*,

*Almost Complete Ossification of the Human Body.* By WM. M. BYERS, M. D., Columbus, Colorado county, Texas.

B., a youth of 17, came under my notice first about four years ago with extensive ossification of the muscular system, which continued to progress till his death, which occurred a short time since. The early history of his case, as given by his family, is as follows:

He was a healthy, stout child at the age of eight months, at which time his parents removed to Texas by land. During their continuance on the road and camping out, they first discovered tumors about in different parts of his body, the size of small marbles, and very hard. These tumors gave apparently but little pain, and in no way affected the general health. After an interval of twelve or eighteen months the tumors began to disappear by absorption, and about the same time stiffness of the joints was manifested. Gradual ankylosis followed, and at the age of ten years the hip joints with those of the arms were completely ankylosed. The ossific matter began then to be deposited in the muscular system. The chest became enclosed with a complete sheet of bone, leaving no traces of outline of the ribs. The head was immovable fixed by the ossification of the sterno-cleido mastoideus on each side. The muscles of mastication were as yet unaffected, and his ability to chew his food not impaired. His digestion was good, and his mental faculties more than ordinary. He could as yet use wrists and hands, his arms being stiffened at right angles, thus allowing him to whittle a little with a pen-knife. When placed upon his feet he could move slowly and cautiously over a smooth surface, but if he got a fall, was unable to arise unassisted. Movement, however, as the ankylosis progressed, became more and more difficult and totally impossible at a latter period. He did not increase in stature after his tenth year, and never manifested any signs of virility. The forms of the muscles were perfectly preserved and could be distinctly felt through the skin, which adhered closely to them. The deposition of ossific matter continued during his life, and, when he died, he was almost complete bone. Up to the hour of his death his mind continued clear and unimpaired, and his digestion, until a short time previous, and was cheerful and apparently happy.—*New Orleans Journal of Medicine.*

*New Operations on the Lower Jaw—Lithotrity.*—To-day (March 9) we saw Mr Maunder, London Hospital, remove one-half the extent of the lower jaw through the mouth, without cutting the skin at all, and preserving a good share of the original periosteum. A myeloid tumour occupied the interior of the bone in the person of a girl 10 years of age. The bone was severed opposite the right canine tooth, and through the middle of the left ascending ramus.

The value of lithotrity was shown in the case of a man who, in eight sittings, had been relieved of two calculi; one had measured one and a half inch, the other one and three-eighths of an inch.—*London Med. Times.*

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*How to Cure a Cold.*—The following is extracted from a lecture by Dr. G. Johnson, the Professor of Medicine in King's College, and may prove interesting to our readers:

The popular domestic treatment consists in the use of a hot foot-bath at bed-time, a fire in the bedroom, a warm bed, and some hot drink taken after getting into bed, the diaphoretic action being assisted by an extra amount of bed clothes. Complete immersion in a warm bath is more efficacious than a foot-bath; but the free action of the skin is much more certainly obtained by the influence of hot air—most surely and profusely, perhaps, by the Turkish bath. The Turkish bath, however, is not always to be had, and even when available, its use in the treatment of catarrh is attended with some inconvenience. In particular, there is the risk of a too speedy check to the perspiration after the patient leaves the bath. On the whole, the plan which combines in the greatest degree of efficiency with universal applicability, consists in the use of a simple hot-air bath, which the patient can have in his own bedroom. All that is required is a spirit-lamp, with a sufficiently large wick. Such lamps are made of tin, and sold by most surgical instrument makers.

The lamp should hold sufficient spirit to burn for half an hour. The patient sits undressed in a chair with the lamp between his feet, rather than under the chair. An attendant then takes two or three blankets and folds them around the patient from his neck to the floor, so as to enclose him and the lamp, the hot air



from which passes freely around the body. In from a quarter to half an hour there is usually a free perspiration, which may be kept up for a time by getting into bed between hot blankets. I have myself gone into a hot-air bath suffering from headache, pain in the limbs, and other indications of a severe incipient catarrh, and in the course of half an hour I have been entirely and permanently freed from these symptoms, by the action of the bath.

Another simple and sufficient mode of exciting the action of the skin consists in wrapping the undressed patient in a sheet wrung out of warm water, then, over this, folding two or three blankets. The patient may remain thus "packed" for an hour or two, until free perspiration has been excited.—*British Medical Journal*.

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• *A Snake in the Stomach*.—As an illustration of the absurd superstitions which obtain currency in the secular press, we produce the following "snake story" from the *Evansville Courier* :—

"A good deal of excitement was created in this city, yesterday, by the report that there was a negro woman in a house on Locust street, between Second and Third, who had a snake in her stomach; and a great many people visited the house. The negro woman came to Evansville about six days ago from Owensboro, Ky., and she states that she has suffered from the snake for about six years. At the pit of the stomach there is a large belt, almost the size of a man's arm; and just where the bones of the breast are separate, an impression is seen through the skin that resembles a snake's head. The belt, which extends around the body, if touched, produces the most excruciating pain to the woman, and as tears fall from her eyes, she cries, "don't make it bite me." On the touch, this belt, or snake, or whatever it may be, contracts, and then the woman suffers, it would appear, the pain of death. One thing singular is this: if the woman has plenty of milk, she experiences no particular pain, but rests quietly."

It is impossible to form a diagnosis from two symptoms exaggerated on hearsay evidence; but, allowing for magnified statements, such a story might arise from dilatation of the stomach with pyloric thickening and chronic ulcer.—*Medical Gazette*.

*Death Following the Application of Creasote to a Carious Tooth.*

—*L'Imparziale* relates that a man aged 36, has lately died in the San Maria Nuova Hospital at Florence, from the results of the application of creasote to a carious tooth. Gingivitis and gangrene of the mouth appeared, and death from septicæmia took place in sixteen days. The relator of the fact mentions that when young, the free application of creasote to a carious tooth which he had, was followed by inflammation of the fauces and fever, by which he was confined to his bed for three days. These local effects ascribed to creasote are remarkable. We are not aware that any similar cases have been described as occurring in this country.—*Brit. Med. Jour.*

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*Squills as a Poison for Rats.*—According to the French "Moniteur" there are in France upwards of two thousand millions of rats and other rodents. Supposing each of these little quadrupeds to commit the damage of only one centime per annum, this loss would amount in the aggregate to twenty millions of francs annually. Hence it is most desirable to find some means of destroying this vermin in large numbers as expeditiously as possible. Nux vomica, arsenic, phosphorus, and traps have been successively tried, but with no very decided success, and certainly not equal to the rate of increase of these prolific creatures. Recent experiments, however, show that squills (*Scilla Maritima*), the bulb of which is much used in medicine, is not only a powerful poison for rodents, but also one they are very fond of. The way of preparing it for the desired purpose is as follows:—One of the bulbs is cut into slices, hashed and bruised, then done in the pan with fat, which is afterwards strained through a cloth and poured into broken plates and saucers to be placed in the cellars and other places infested with rats, mice, &c. To prevent dogs and poultry from eating of this poisonous compound in stables, pigeon-houses, or farm-yards, it may be put into a wooden box, about a foot and a half long, and having a hole at each end. The rat gets in at one end and goes out at the other, after partaking of the noxious food, which soon kills it. Squills may also be reduced to powder for the same purpose by bruising them in a mortar to a pulp, which is afterwards incorporated with as much flour as it will hold. This paste is then rolled out, as they do

for a pudding, then cut into shreds, which are left to dry on hurdles or on sheets of pasteboard, and are afterwards pounded in a mortar. The powder thus obtained will keep for years, and may be put into boxes or barrels. If manufactured on a large scale, it may become a profitable article of exportation. In Algeria squills cost nothing, the country being absolutely over-run with them.—*Lond. Phar. Journ.*

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*Influence of Sewing-Machines on Health.*—Some prejudice has been excited against the use of sewing-machines on the score of their injurious effects on health. As the result of some investigation on the subject, we may avow our conviction that these statements have been greatly exaggerated. They apply, we believe, chiefly to those worked by one foot only; and we are quite unable to discover that there is any kind of objection on the score of health to those in which both feet are employed. In America, where the use of machines is yet more common than with us, the attention of medical men has been a good deal directed to the subject, and with, we believe, tolerable unanimity of result. Against the double pedal-machine in common use in England, as far as we can learn from inquiry amongst those who have had them for many years in constant employment, there is not the slightest evidence. Of their sanitary advantages in saving time from a sedentary and very tiresome occupation, and thus favoring relaxation and exercise, it is not necessary that we should speak.—*Brit. Med. Jour.*

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*Bichloride of Methylene.*—Dr. Charles Bell Taylor, in the course of a paper on cataract extraction (*British Medical Journal*) calls attention to the rapidity with which anaesthesia is induced by the bichloride of methylene. When given with an inhaler, from which air is almost entirely excluded, insensibility is caused in half a minute, and the effect passes off in two or three minutes. It is said to be quite equal in its properties to nitrous oxide for slight operations, such as tooth-extraction, and, indeed, has long been used by a dentist in Brighton.—*Med. Gazette.*

*Doses for Hypodermic Use.*—In answer to the many inquiries made by correspondents concerning the medicines and their doses, to be used by hypodermic injection, we insert a table prepared by a young physician of this city for a new Visiting-list, just issued here by another physician, also of this place :

**ACONITE** (*Aconitia*, *Off.*)—R. Aconitiæ, gr. j ; aquæ destillatæ purissimæ, f. 3 ss. Misce et fiat solutio. DOSE—*minimum*, M. ij= $\frac{1}{120}$  gr. : *maximum*, M. iv= $\frac{1}{60}$  gr.

**ATROPINE** (*Atropia*, *Off.*)—R. Atropiæ sulphatis, gr. j ; aquæ destillatæ pur. ; f. 3 ss. Misce et fiat solutio. DOSE—*minimum*, M. ij= $\frac{1}{120}$  gr. : *maximum*, M. iv= $\frac{1}{48}$  gr. Best of all medicinal remedies for every kind of pain in pelvic viscera.

**CAFFEINE, THEINE.**—R. Caffeinæ, gr. ij ; aquæ destillatæ bullientis, M. lxxx. Misce et fiat solutio. DOSE—*minimum*, M. 20= $\frac{1}{2}$  gr. : *maximum*, M. 40=1 gr. Neuralgia and alcoholic insomnia.

**STRYCHNINE** (*Strychnia*, *Off.*)—R. Strichniæ sulphatis, gr. ij ; aquæ destillatæ bullientis, 3 j. Misce et fiat solutio. DOSE—*minimum*, M. ij= $\frac{1}{120}$  gr. : *maximum*, M. iv= $\frac{1}{60}$  gr. Gastralgia and neuralgia of heart.

**MORPHINE** (*Morphia*, *Off.*)—R. Morphiæ acetatis, gr. v ; acidi acetici, M. j ; aquæ destillatæ bullientis, f. 3 j. Misce et fiat solutio. DOSE—*minimum*, M. j= $\frac{1}{2}$  gr. : *maximum*, M. vj= $\frac{1}{2}$  gr. Ten grains to a drachm can be dissolved by use of glycerine. Especially useful in delirium tremens and neuralgic pains.

**NICOTINE** (*Nicotina*—R. Nicotinæ, gr. j ; aquæ destillatæ puriss., f. 3 ss. Misce et fiat solutio. DOSE—*minimum*, M. ij= $\frac{1}{120}$  gr. : *maximum*, M. iv= $\frac{1}{60}$  gr. Useful in tetanus.

**DIGITALINE** (*Digitalia*, *Off.*)—R. Digitaliæ, gr. j ; aquæ destillatæ purissimæ, f. 3 ss. Misce et fiat solutio. DOSE—*minimum*, M. ij= $\frac{1}{120}$  gr. : *maximum*, M. iv= $\frac{1}{60}$  gr. Useful in febrile conditions.

**CALABAR BEAN** (*Physostigma Venenosum*.)—R. Extractum physostigmatos venenosi alcoholici, gr. ij ; aquæ distillatæ purissimæ, 3 ij ; glycerinæ, 3 j. Misce et fiat solutio. DOSE—*minimum*, M. 20= $\frac{1}{15}$  gr. : *maximum*, M. 40= $\frac{1}{2}$  gr. In tetanus—*American Practitioner*.—*Am. Electric Med. Review*.

## EDITORIAL DEPARTMENT.

*The Southern Dental Association Meeting at New Orleans* we learn, was one of the most interesting ever held in this country. We expect to publish a full report of the proceedings in the June No. of the Journal. As the meeting was held on the 13th 14th 15th and 16th of last month, it was impossible for us to obtain the proceedings in time for publication in the present number. That the members of the profession in attendance were well entertained by their brethren of New Orleans is evident from the following account of a dinner given them at the Washington Hotel, Lake End:

"The party with their invited guests, among whom were a number of ladies, left the city on the 2 o'clock Ponchartrain cars, and sat down at table at 4½ o'clock. The dinner considering the short notice given for its preparation, was nicely served, the guests from Northern latitudes seeming to be particularly charmed with the profusion of roses and other floral decorations. Among the profession present from the far interior, there were some who had never tasted an olive, a shrimp, a crayfish or an artichoke, but who, nevertheless, indulged in each and in all to a greater or less extent, acquiring in some instances a wonderful penchant for the, to them, novel edibles. Strawberries, bananas and other native and tropical fruits were specially enjoyed by the assembled company.

In the course of the entertainment toasts were offered and happily replied to by Dr. Frederick Knapp, Dr. Taft, of Cincinnati, Dr. Casadavant, Dr. Thurber and Dr. Walker, of the profession and by members of the press present.

Mr. Hape, of Atlanta, of Dental Depot fame, was presented with a splendid gold headed cane, by the Southern Dental Association, Dr. Morgan, of Nashville, making the presentation.

Both the presentation address and the reply were exceedingly felicitous. When the writer left the party, at 8 o'clock, they were still enjoying themselves, the ladies sipping their ices, while the gentlemen replenished their glasses between toasts with sparkling champagne. Before dinner was announced, the ladies of the party, with their escorts, went out for a stroll through the gardens of the hotel, and were much delighted with the show of flowers and the glimpses which they got of the lake and the vessels upon it, whose white sails were bellying out with the fresh southeaster."

The Reporter of the New Orleans Picayune writes as follows of clinics, &c. held during the session of the Association:

"The clinic operations of the Southern Dental Association, now in session at the Mechanics' Institute, in our city, are exceedingly interesting, even to the general observer.

These operations take place during the morning hour in the convention hall. The operations this morning consisted in one instance of the filling over of an exposed nerve, an operation about the success of which there has not been an entire unanimity of opinion in the profession heretofore.

The operation in question was performed in the most skillful manner by Dr. F. Y. Clarke, of Savannah, Ga., who is an enthusiastic believer in the power of the dentist to save teeth of this kind.

It is contended that in these cases nature, if assisted, will do the work of re-covering the nerve; so as to admit of a perfect filling.

Through the courtesy of Dr. Morrison, of St. Louis, we were shown two newly introduced dental instruments invented by Dr. E. R. E. Carpenter, of Chicago, which are destined to work, and are in truth now working, a great revolution in dentistry. The new instruments, or rather the application of a motive power to the old instruments, are a pneumatic burring engine and plugger, by which cavities are cleaned out and filled by the aid of a tiny air apparatus which is worked by the foot upon a pedal.

The old fashioned dental burring instrument was capable of making about eighteen or twenty revolutions a minute, while the new one will make some eighteen hundred.

The plugging machine moves also in a corresponding manner, doing in five minutes what used to require one hour's time.

Dr. Butler, of Louisville, has upon exhibition an improved dentist's chair, which is capable of being moved in any way that the operator or subject may desire. It is in marked contrast with an old chair sitting near it, some twenty-two years old, used for a long time by Dr. J. S. Clarke and our townsman, Dr. Freidrichs, the well-known dentist."

From the kind reception extended to the numbers of the Association at the Atlanta meeting, we felt assured that our New Orleans colleagues would do all in their power to make the meeting in their city one long to be remembered as a pleasant reunion, and we have not been disappointed.

We deeply regret that circumstances beyond our control should have prevented our being present. The next annual meeting will be held in Charleston S. C. where we again feel assured that true Southern hospitality will be extended to all who may attend.

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*Monument to Dr. Horace Wells, the Discoverer of Anæsthesia.*—The Dental Association of Hartford, Connecticut, are about to erect in that city a suitable monument or statue to the memory of Dr. Horace Wells, formerly a practicing Dentist, in honor of the great discovery which has conferred such blessings

on suffering humanity. We are pleased to learn of this interest on the part of the Dental Association, for the proof is so conclusive that to Dr. Wells belongs the honor of the discovery, that no honorable and unbiased person can ignore it. Prof. J. Y. Simpson, of the University of Edinburgh, Scotland, in a late paper, extracts from which we published in the last No. of the Journal, awards to Dr. Wells the merit of "extracting teeth from a dozen or more patients, rendered insensible by inhaling nitrous oxide gas" at least two years previous to the time when Drs. Jackson and Morton resorted to its use.

At a regular meeting of the Hartford Society of Dentists, held at the office of Dr C. M. Hooker, April 11, 1870. the following resolutions, presented by Dr. McManus, were adopted:—

*Resolved*, That the natural gratitude due to the memory of public benefactors, imperatively demands that the city of Hartford and the State of Connecticut, with the medical and dental professions, cause a suitable monument to be erected in the public park of this city, in memory of Dr. Horace Wells, the discoverer of anæsthesia.

*Resolved*, That Drs. J. M. Riggs, James McManus, E. E. Crofoot, C. M. Hooker and Wm. Blatchley, be and are hereby appointed a committee, whose duty it shall be to cause suitable petitions to be presented to the city council of Hartford and the general Assembly of this State in furtherance of this object, and to obtain signatures to the same.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.      THIRD SERIES--JUNE, 1870.      No. 2.

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ARTICLE I.

*Recent Views on Digestion.*

BY J. R. BROMWELL, D. D. S.

(*Concluded.*)

After the food has been triturated and disintegrated by the teeth, aided by the muscles of mastication, and thoroughly mixed with saliva, it becomes a soft pulpy mass, and is conducted by the involuntary muscular movements through the cardiac orifice into the stomach, there to be acted upon by the most important digestive fluid—viz. the gastric juice. Food after passing from the œsophagus enters the stomach in successive waves, and is immediately subjected to the peculiar peristaltic movement, the object of which is to thoroughly mix the gastric juice with the alimentary mass, and also to aid the solution of the latter by the gentle trituration it is subjected to.

The food after entering the stomach of man, is carried by the contractions and relaxations of the longitudinal and transverse fibres of the muscular coat, from the cardiac orifice down into the splenic extremity, and follows the great curvature towards the pyloric orifice. It then returns towards



the small curvature, makes its appearance again at the aperture in its descent into the great curvature to perform similar revolutions.

These revolutions are performed in from one to three minutes ; the process is at first slow, and gradually increases, as chymification advances. There is also towards the latter stage an increased impulse towards the pylorus. The food is not only subjected to the mechanical action of the stomach, but also to the liquifying, and catalytic action of the gastric juice. The gastric juice is secreted by the walls of the stomach, especially from the glands near the pyloric orifice. It is, in a pure state a clear, perfectly colorless acid fluid.

In place of the lactic acid, found by Lehmann, Bidder and Schmidt found hydrochloric. Lehmann also admits that hydrochloric acid is present in a small quantity, but with Robin and Verdeil, regards the acid reaction of the gastric juice, as due to lactic acid. Bernard states that hydrochloric acid, is only produced by the decomposition of some of the chlorides, which enter into the composition of the fresh gastric juice. The free acid of the juice is a very important ingredient, for if it be neutralized by an alkali, it fails to exert its solvent action upon food. The most important ingredient of the gastric juice is its organic compound pepsine.

It is regarded as one of the real, anatomical ingredients of the juice, and essential to its composition. It is the active digestive principle of the digestive fluid of the stomach. Gastric juice—like the saliva, is secreted in considerable quantity only under the stimulus of food. During the intervals of digestion, there is little or no gastric juice secreted, but immediately upon the introduction of food, the gastric juice is fully poured out, and in sufficient quantity to digest enough food to supply the waste of the system. The quantity of the secretion of the gastric juice varies according to the kinds of food, and the physical and mental condition of the man. Irritation of the temper, excitement, &c., will frequently diminish, or suspend the secretion of the gastric

juice. Total quantity of gastric juice secreted daily in the human subject is 14 lbs. (av). This estimate, says Dr. Dalton, is not an exaggerated one.

Digestion is, strictly speaking, a chemical process, for food can be digested outside of the stomach by being exposed in a test tube to the action of pure gastric juice, which may be obtained from the stomach of a dog by means of an artificial gastric fistula, into the orifice of which a small silver canula is inserted so that the gastric fluid can escape. Food not only undergoes a liquifying process in the stomach, but all albuminoid substances are transformed by the catalytic action of the organic principle of the gastric fluid. For the active operation of this substance, it must be dissolved in an acid fluid, and be subjected to a certain degree of warmth. It is checked by any low or high degree of temperature. By the action of pepsine, all albuminoid substance without distinction are transformed into a new substance called albuminose. This substance is similar in its character to all organic compounds. It is not crystalizable, and contains nitrogen as one of its ultimate elements. This substance when in solution in gastric juice, interferes with the operation of Tromer's test for grape sugar, and also with the mutual reaction of starch and iodine, for if starch be mixed with gastric juice containing albuminose, and iodine be added, it fails to produce the blue color. This does not take place when mixed with pure gastric juice. Another peculiar and remarkable property of the gastric juice, is its inaptitude for putrefaction. Dr. Dalton states that it may be kept for a long time in a common glass bottle without showing any signs of putrefaction. And again, although gastric readily attacks all food containing albumen, when introduced into the stomach it does not at all effect the walls of the stomach, for gastric juice is incapable of eroding living material. Dr. Dalton explains these singular and contradictory facts as follows: The process of digestion is not a simple solution, but a catalytic transformation of the alimentary substances, produced by contact with the pepsine of the gastric juice. We

know that all the organic substances in the living tissues are constantly undergoing, in the process of nutrition, a series of catalytic changes, which are characteristic of the vital operations, and which are determined by the organized materials with which they are in contact, and by all other conditions present in the living organism. These changes, therefore, of nutrition, secretion, &c., necessarily exclude for the time all other catalyses and take precedence of them.

As soon as life departs, the walls of the stomach are at once attacked, and very often wholly destroyed.

The length of time for digestion varies according to the kinds of food, and is influenced, as before stated, by the mental as well as the physical condition of the man. For food to be digested properly it should never be taken, only when the appetite demands it; and it should be thoroughly masticated and mixed with the saliva. Many persons mistake appetite for hunger, and continue eating until the stomach is over-loaded, and the digestion of so large an amount of food being too much for the action of the stomach produces indigestion and finally, if the habit is continued, dyspepsia.

The food from the stomach, mixed with gastric juice, passes into the small intestine through the pyloric orifices. As before mentioned albuminoid substances are the only ones digested in the stomach. We therefore have left, as the remaining digestible ingredients of the food, the fats, starch and sugar. It has been stated by physiologists that cane sugar was digested in the stomach by the action of the gastric juice. This is now believed to be correct, for some of the most eminent physiologists of the present day, state that they have failed to detect the slightest trace of glucose, in the stomach of dogs fed upon sugar and then killed, or having gastric fistulæ. Cane sugar is therefore, either directly absorbed in the stomach, or passed into the intestinal canal to be acted upon by the fluids found therein. That starch is not digested in the stomach but in the intestines, is a matter in regard to which there is no longer any doubt.

The glands situated in the mucous membrane of the small intestine, follicles of Luberkuhn and Brunner's glands, secrete the intestinal juice proper. This fluid has the property of converting starch into sugar. This effect may be produced outside of the intestine, by exposing starch in a test tube to the action of this fluid.

Dr. Dalton remarks that if a dog be fed with starch and meat, while some of the meat remains in the stomach from eight to ten hours, the starch begins to pass at once, after liquifaction, into the intestine, where it is converted into sugar and rapidly absorbed. The whole of the starch may be transformed into sugar, and absorbed in one hour.

In regard to the composition of the intestinal juice, there is nothing definite, owing to the fact that in the duodenum you find a mixture of three different fluids, viz: the bile the pancreatic juice and intestinal juice proper according to the experiments of Bidder and Schmidt. It resembles physically, the secretions of the mucous follicles of the mouth. It is a clear, colorless, glossy, viscid fluid with a distinct alkaline reaction, possessing the property of converting starch into sugar when mixed with it in a test tube, and kept at the temperature of 100° F. This fluid exists in small quantity in the intestine, although the follicles of Luberkuhn are very numerous. The next and last remaining ingredients of food that require digestion, are the fats or oily matters. These substances are only melted by the action of the gastric juice and the warmth of the stomach, and are set free from the vessels, fibres, &c., in which they are contained, and pass in this state into the duodenum to be acted upon by one of the intestinal juices, viz: the pancreatic fluid. Although mixing as the fats do with all three of the juices of the intestine, they are only acted upon by one of them. Bernard was the first to throw any light upon the digestion of fats. In the rabbit the biliary duct opens as usual just below the pylorus, while the pancreatic duct opens into the intestine some five or six inches below. Bernard fed these animals on fatty substance, then killed them and examined

their small intestine; between the biliary and pancreatic ducts he found no chyle, but below the opening from the pancreas, the chyle was in abundance, proving clearly that fats are digested in the intestine by the action of the pancreatic fluid. Very soon after the oily matters enter into the small intestine and are mixed with pancreatic fluid, they lose their characteristic form, and are converted into a white, opaque emulsion known by the name of chyle. This emulsion undergoes no further change, but is at once absorbed. Pancreatic juice, as obtained by the experiments of Bidder and Schmidt, is a clear colorless slightly viscid fluid, with a very distinct alkaline reaction. It is composed of

|                     |   |                |   |   |   |   |   |         |
|---------------------|---|----------------|---|---|---|---|---|---------|
| Water,              | . | .              | . | . | . | . | . | 900.76  |
| Organic Matter,     | . | .              | . | . | . | . | . | 90.38   |
| Chloride of Sodium, | . | .              | . | . | . | . | . | 7.36    |
| Free Soda,          | . | .              | . | . | . | . | . | 0.32    |
| Phosphate of Soda,  | . | .              | . | . | . | . | . | 0.45    |
| Sulph. of Soda,     | . | .              | . | . | . | . | . | 0.10    |
| Sulph. of Potassa,  | . | .              | . | . | . | . | . | 0.02    |
| Combinations of     | { | Lime,          | . | . | . | . | . | 0.54    |
|                     |   | Magnesia,      | . | . | . | . | . | 0.05    |
|                     |   | Oxide of Iron, | . | . | . | . | . | 0.02    |
| Total               |   |                |   |   |   |   |   | 1000.00 |

Like all the digestive fluids the most important ingredient of this juice is its organic matter or pancreatine. This substance is in greater abundance in this juice in proportion to its other ingredients, than is the organic matter of any other digestive fluid. It is similar to albumen in regard to its being coagulable by heat, but may be distinguished from it by its being precipitated by sulphate of magnesia. The action of this substance in all oleaginous matters is instantaneous and permanent.

The oils do not undergo chemical change by the action of this fluid, but are simply reduced to a state of perfect emulsion.

In this state the fat is capable of being absorbed, and therefore its digestion may be said to be accomplished. We

have now followed all the different varieties of food through the process of digestion, and glanced hurriedly at the nature and composition of the various digestive fluids, with the exception of the bile. Before speaking of this fluid, we will mention briefly some of the most important facts in regard to the anatomy of the organ by which it is secreted, the liver.

The liver is the largest glandular organ found in the body. It is situated immediately beneath the diaphragm, in the right hypochondriac region and extends across the epigastrium into the left hypochondrium. Its weight, according to a statement made by Prof. Noel, is from 4 to 5 lbs.

Its transverse diameter is, according to Gray from 10 to 12 inches, antero-posterior diameter from 6 to 7 inches, and the back part of the right lobe (the thickest part) is 3 inches in thickness. Its upper surface is convex, covered by peritoneum, and is in relation with the diaphragm. This surface is divided into two unequal lobes by the suspensory or broad ligament.

The under surface is concave and in relation with the stomach, the duodenum, the hepatic flexor of the colon, the right kidney and supra renal capsul. This surface is also divided into two lobes, a right and left, by a longitudinal fissure.

The posterior border is rounded, broad, and connected with the diaphragm by the coronary ligament. The anterior border is sharp and thin, it is marked by a deep notch. The right extremity of the liver is thick and rounded, whilst the left is thin and flattened.

The liver has five ligaments, five fissures and five loes. The ligaments are the longitudinal, broad or suspensory, the two lateral, coronary and the round. The first four are formed of peritoneum, the fifth is a fibrous cord the result of the obliteration of the umbilical vein. The fissures are the longitudinal, the fissure of the ductus venosus, the transverse fissure, the fissure for the gall bladder, and the fissure for the vena cava.

The lobes are, first and largest, the right ; second. the left ; third, lobulus quadratus ; fourth the lobulus spigelii ; fifth and finally, the lobulus caudatus.

The structure of the liver is held together by very fine areola tissue, it is composed of lobules aggregated into lobes, of the ramifications of the portal vein, hepatic duct, hepatic artery, hepatic vein, lymphatics and nerves, the entire gland being enclosed by a fibrous, and serous coat. According to Gray, the lobules form the chief mass of the hepatic substance.

The function of the liver is mainly to secrete bile, and to produce sugar and fat. Bile is a dark golden brown, or greenish yellow fluid, is viscid and glutinous in consistency. Its reaction, says Dr. Dalton, is either neutral, or very slightly alkaline.

This fluid is depurative. If allowed to stay in the system for any length of time without undergoing transformation, it acts as a poison. It is to a certain extent antiseptic ; when secreted in excess it acts as a purgative ; if not in sufficient quantity costiveness and flatulence is the result. The coloring matter of bile is supposed to be its poisonous ingredient, owing to the fact that all the other ingredients of the bile are transformed or digested, reabsorbed and returned to the blood as hydrocarbon or fat ; the biliverdin being discharged as fecal matter. The function of the bile to a certain extent is digestion, it has the property of digesting the fatty acids, and promoting the absorption of fatty emulsions.

Some writers contend that bile is only an excrementitious substance, and has no important function to perform in the intestinal canal. This theory is disproved, for if we stop and consider for one moment the great size of this gland, we must conclude at once that it was intended to perform a more important function than that of simply excreting excrementitious products ; and then again if the supply of bile be cut off from the intestinal canal, we have great emaciation, rapid degeneration of tissue and ultimately death.

The only ingredient of bile that may be considered as excrementitious is its coloring matter.

In conclusion, I will add that digestion is a complication of several processes, that take place successively in different parts of the alimentary canal.

The food on entering the mouth is subjected to the processes of mastication and insalivation, from there it passes into the stomach mixed with saliva to undergo the process of gastric digestion. That wholly or partially performed, it passes into the small intestine to undergo further digestion by the combined action of the gastric juice, which is still mixed with the food, and the various intestinal juices. The various indigestible and partially digested ingredients of food, are then passed through the ileo-cæcal valve into the large intestine to be finally discharged from the anus as fæces.

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## ARTICLE II.

### *Mercury in Vulcanized Rubber Plates.*

BY JAS. B. HODGKIN, D. D. S.

As an item concerning the "mercury contained in dental plates made of India Rubber," has attracted some attention, I beg leave to offer a few statements with regard to the same, to relieve the minds of the very large class of persons who having been unfortunate enough to lose the organs provided for them by nature, and who being dependent on the dentist for substitutes, have been furnished with teeth mounted on plates made of India Rubber. I say "the very large class," for it is doubtless true that nine tenths of those wearing artificial substitutes for the natural teeth have rubber plates.

The mercury so-called, is not mercury in fact, any more than cider is vinegar, or starch is sugar, for while it is a compound of mercury, yet any chemist knows that the poisonous qualities of many simple bodies are altered or rendered inert by chemical manipulation. "Vermilion" is the preparation



necessarily used by the manufacturers of India Rubber to give that article the ordinary red tint. This is the "sulphuret of mercury," " $\text{Hg. S.}$ " containing equivalent proportions of mercury and sulphur, an insoluble compound under ordinary circumstances. The quantity used in an ordinary set of teeth is from 30 to 60 grains, about one fourth or one fifth of the bulk of the plate. This is combined with the rubber, while the latter is in a plastic condition, and the compound hardened by the dentist as it is worked up by him. When thus hardened the resulting product known as "Vulcanite" is a firm, tough substance, familiar to the public in another form and color, as used in handles for knives, combs and the thousand uses to which this very extraordinary and most useful article is devoted.

We have then in a rubber dental plate, about on an average 45 grains of sulphuret of mercury firmly combined with rubber, in such a form that it cannot be reduced to the metallic or soluble condition, except by a degree of heat sufficient to sublime the mercury, (which takes place at 662 degrees F., and this of course could not occur in the mouth, when it is remembered that water boils at 212.) No other change can occur but this, and this leaves but one other source of danger of mercurial poisoning, and that would be from the wearing away of the plate and the consequent swallowing of the particles thus worn off. As these plates last for from ten to fifteen years and then do not wear out, but fail from some molecular change in the rubber, it will be apparent that this danger is not great. I have repeatedly examined rubber plates that have been worn for a year, and found the original polish not worn off.

I trust that what I have thus hastily written will put at ease some who have fancied themselves in danger of being poisoned—a danger altogether in the imagination, or invented by interested parties. The fact that countless thousands of persons of various ages and sexes have been wearing such plates for years with comfort; is a sufficient answer to this question of poisoning.

It may not be a miss by the way to add that a great many good people really do not know that they are taking mercury when they are, and blue pills, calomel and the like are swallowed under high sounding names very often; while the good lady who prescribes Ayer's pills or 888's thinks these are harmless vegetable compounds, it is perhaps as well, for physicians know that mercury is yet as it was named long years ago, "the strong man among remedies."

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### ARTICLE III.

*Prof. Noel's Reply to Prof. Judd.\**

The April No. of the *Missouri Dental Journal* has a short criticism upon an article published in the Feb. No. of the *American Journal of Dental Science*; the article in question was an abstract of a lecture delivered before the class at the Baltimore College of Dental Surgery, and embraced the most recent views as regards the histology of enamel and dentine.

As the author of this piece, I wish to explain my views more clearly, and endeavor to remove the misapprehension under which I think my *critic* is laboring. I regret that I should have been deficient in lucidness, and while adhering most tenaciously to the opinions already advanced, I am ready at any moment to yield them, *provided*, they can be proven false and better ones substituted for them.

In this lecture I asserted, that, "Fresh Dentine has no tubuli but has uncalcified fibrillæ solid, or nearly solid;" also "that the tubuli found in the dry tooth, or dead and dry tooth, are formed by the desiccation and evaporation of these dentinal fibrillæ, and have no existence in the living tooth."

The writer in the *Missouri Journal* makes the following comment upon those two statements: "*We must confess that we do not exactly understand why a set of hollow rods should be converted into fibrillæ, and declared not to be*

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\*See editorial for Prof. Judd's, review of Prof. Noel's Article, on "Enamel and Dentine."

*tubuli, because they are filled with a fluid or a soft solid matter. Fill a hard tube with water, or with any other substance that does not blend with it and make a part of the solid substance itself, and it will not change the tube into a fibre, or in any way destroy its identity."*

The first portion of the quotation is a "petitio principii" and in assuming the existence of the "hollow rods" the writer has taken an unproved position, and reasons from it as if he had demonstrated the actual existence of the "hollow rods" in the fresh dentine. And as to converting "hollow rods" into fibrillæ, I do not think any one ever attempted such a feat—my language was most thoroughly misconstrued if such an idea was derived from it.

*The Dentine Organ.* I asserted that the Dentine Organ, prior to calcification, consisted of fibrillæ more or less branching and arborescent; that it began near the inner surface of the enamel organ and terminated by blending in organic continuity with the pulp tissue; that these fibrillæ occupied the entire dentine organ and there was no interfibrillæ substance whatever; that in most of the fibrillæ the entire germinal or nuclear matter, changed into formed material, as soft semi-solid fibrillæ substance; but in some few, or comparatively a smaller number, the germinal or nuclear matter in the central axis of the fibrillæ remained *for a time* unchanged, or it might remain *permanently* as germinal matter; but there was a possibility of this central axis of germinal matter changing to formed material at any time, that is it might become fibrillæ substance as all the germinal matter of the solid fibrillæ, had done before it; once changed and the fibrillæ would be identical in every respect with the other solid fibrillæ; that this change might take place after the tooth was calcified, for the surrounding fibrillæ might calcify and leave the incompletely formed fibrillæ uncalcified; now these uncalcified fibrillæ would be surrounded by *dentine* resulting from the direct calcification of contiguous fibrillæ.

The fibrillæ yet uncalcified, and having a periphery of

formed material and central axis of nuclear matter, may remain for years in this condition; or they may have the formed periphery calcified, leaving only a central axis of nuclear matter with or without a thin stratum of formed material between the germinal matter and calcifying periphery; again, the whole central axis of nuclear or germinal matter may change gradually to formed material and as formed material may undergo calcification and become dentine; thus we might have solid dentine on the exact line once occupied by the axis cylinder of nuclear or germinal matter. In such instances the germinal matter (*central*) changes to formed material, as the formed material (*peripheral*) calcifies and becomes dentine. This may take place at any time from youth to old age, and is the true explanation of the "condensation of dentine." That is to say—Dentine in adult life may become denser—harder, and better by calcification of these fibrillæ; *all dentine is calcified fibrillæ and all fibrillæ are liable to become calcified and thus form dentine; therefore at all times dentine is being formed and fibrillæ are being more or less completely transformed into it; there is no inter fibrillæ substance, which calcifying becomes dentine, but dentine results from a direct calcification of the fibrillæ themselves, from the line of conjunction of enamel and dentine to the periphery of the pulp.* The solid portions of the fibrillæ and the connective tissue of the pulp—the central axis of nuclear matter and the germinal or nuclear matter of the connective tissue blend so intimately, that the organic continuity seems unbroken upon the periphery of the pulp; and this pulp periphery is a purely arbitrary thing with no fixed limit, for just as the fibrillæ in the dentine may calcify slowly, so may the terminal ends (of all the fibrillæ already calcified to form dentine) slowly calcify and encroach upon the pulp, giving an increase of dentine by exactly the amount of pulp lost.

There are no canals, but semi-solid fibrillæ in fresh dentine, and these fibrillæ in the living tooth may calcify and give solid dentine; the calcified and the uncalcified portions

of a fibrilla do not remain upon fixed lines, but the calcification has a tendency to slowly encroach upon the fibrilla and may even completely transform it into dentine. In a living tooth, therefore, there can be no dentinal tubes in the ordinary acceptation of the phrase, and the tubes of the dry tooth depend upon the desiccation and evaporation of the fibrillæ which here remain uncalcified, and the argument drawn from the "hard tube filled with water," &c., &c., does not apply to the case in question as all must at once see, for the fibrillæ need only the mineral deposition to become dentine; and the surrounding dentine is nothing more than this mineral deposition in fibrillæ.

I also asserted that "Enamel and Dentine are not vitalized tissues so far as the calcified portions are concerned—enamel is dead, perfectly dead and so is the calcified portion of dentine (or dentine proper)." To this the writer objects, and thinks my use of the term "organic base," to represent the enamel and dentine organs prior to calcification gives proof of their being vitalized tissues after calcification. This will depend upon *his* definition of a "vitalized tissue,"—I used the phrase in the sense that recent physiological writers have adopted, viz: of "*changing under vital forces*"—of exhibiting the three forces of organic life (1) assimilation, (2) propagation, (3) development; the *organs* are organic products,—products of vital action and when calcified become enamel and dentine, but by the very act of calcification they lose their position with soft structures and take a perfectly distinct relation to the system, subserving the purest kind of physical purpose. The calcified enamel never changes and the calcified dentine never changes, *save in obedience to physical forces*; bone does change, is constantly changing, is being renewed and transformed from birth until death, certainly until extreme old age; it changes in obedience to the forces of organic life, enamel and dentine do not. Enamel filed or cut does not renew itself, dentine cannot renew itself, and can only condense in virtue of its fibrillæ; metallic pins, rings &c., placed

in bone are found after varying periods, to have changed their positions with respect to each other and with respect to the bone, because the bone has undergone vital changes; but do fillings of gold ever become imbedded in enamel or dentine, or are they ever covered by growths of new enamel or new dentine?

The hair and the nails,—the fragments we are accustomed to clip off and throw away, belong to the same class of structures as the teeth; they have an “organic base” and are equally as dead as enamel so far as the usual signs of vitality are concerned; the central axis of the hair, near the hair follicle may have masses of germinal matter and may exhibit a feeble degree of vital power, but at the extreme end it has only a physical form, and like the nail has no sensibility and undergoes no change save in obedience to physical forces.

If enamel be alive and if it can undergo any change whatever in virtue of its organic base, pray what is the change? Certainly not renewal, for filling the root with gold and taking off every possibility of vascular and nervous supply does not alter it at all; nor does it alter the calcified dentine. Are there any *soft structures* in the body which can be for an indefinite period of time, say years, deprived of all vascular and nervous supply and yet live? Now “*the general law which dominates over all other soft tissues*” to use the writers own language, proves conclusively that enamel and dentine are not soft tissues. Or does killing the pulp and removing it, also kill the enamel and dentine? if so, what are the evidences of their death? They remain for years apparently unchanged, and often exhibit decay with all the phenomena incident upon that process except pain; if enamel undergoes any change in obedience to vital force what is the change, since interstitial nutritive changes are certainly not to be found in it? and the pain in decay is dependent upon the dentinal fibrillæ and not upon the enamel; enamel in itself is perfectly insensible, it has neither nerves, nor blood vessels—nor fibrillæ; if enamel ever gives

evidence of sensibility it must be in extremely rare cases, and only where the dentinal fibrillæ have been prolonged into the enamel, or rather into the enamel organ and have escaped calcification, thus giving an unbroken line from enamel to pulp.

My position is wrong also, says this critic, because the assertion that enamel and dentine having an "*organic base*," which calcified will remain "*unchanging and unchanged during a long term of years, militates against that higher law which ordains that constant change is stamped upon every atom of matter throughout the universe*;" now that phrase is rather a pretty one, but has not the least particle of force as an argument. I contend that enamel does not change in obedience to "*vital force*" and therefore is not a vitalized structure; that it may and does change in obedience to physical forces I admit, but that only confirms the assertion that it is "*dead*;" that as far as vital force is concerned, once calcified, and it is a mere mineral and obeys physical and chemical, but is not amenable to any of the laws of vital force.

Every atom of matter in the universe *may be under a law* of "*incessant change*," but if the changes are to us *inappreciable*, I contend that it is not proven. Before me is an old glass ink stand I have had for years, it is evidently composed of atoms of glass and they may be "*constantly changing*" but I cannot appreciate these changes; my upper central incisors have been filed apart, it was performed some ten years ago, the atoms of enamel like the atoms of glass, may be constantly changing but I cannot appreciate the slightest change in one any more than I can in the other, and how shall I know that they exist?

I have a friend travelling in Europe, he writes to me that he saw at a Cathedral, a molar tooth said to have belonged to one of the apostles or bishops of the "*Early Church*;"—evidently some hundreds of years old;—now perhaps the "*organic base*" of the enamel of that tooth has been undergoing "*constant change*" for the last 1800 years, or at any

rate a great number of years, but my friend failed to appreciate it, for he said, "it was a fine tooth," "in a state of excellent preservation."

Finally—this writer says—*If we were asked to furnish evidence that enamel was not dead—perfectly dead—we would point to the fact, that it is many times exceedingly sensitive to the touch and that sensibility is one of the most certain signs of vitality wherever it exists. Can any one give as good a reason for supposing it dead?*

1. It is an assertion unproven, to say that enamel in *itself* is sensitive, it has neither nerves nor fibrillæ.

2. If *sensitiveness* should be the test of vitality, then enamel is only *vital* when it shows *sensitiveness* and when it does not show it, why it must be *dead*.

3. Sensitiveness is not one of the most certain signs of vitality wherever it (vitality) exists, nor wherever it (sensitiveness) exists, (sentence capable of each construction and wrong in each;) a sporule of mildew, a grain of wheat or of corn, or any vegetable seed, may germinate, grow, &c., but is there any sensitiveness about this or about any vegetable growth? and in the first few weeks of human embryonic life, when not an animal system has yet been evolved, but the organic life is active indeed, there cannot be sensitiveness for there is no nervous system, yet here is an abundance of vitality; *so there may be vitality without sensitiveness.*

"*Extreme sensitiveness*," is nearly allied to *pain*, and Dr. Thos. K. Chambers of London, in his excellent lectures upon the "Renewal of Life" says. "Pain in short is the brother of death; a painful part is never performing its whole vital functions—it is partially defunct."

It is therefore the best evidence of some kind of lesion of the peripheral nerves or nerve centres and indicates disease; *pain, extreme sensitiveness*, and *sensitiveness* are attached to and depend upon the nervous system but have no relation save an incidental one to the functions of organic life.

Enamel has no nerves and usually no fibrillæ; dentine has fibrillæ which act as nerves; the sensitiveness of dentine



depends upon its fibrillæ; if enamel should *ever* be "*extremely sensitive to the touch*," it is from a deranged condition of the *dentinal fibrillæ* accidentally prolonged into the enamel. Calcified Enamel and Dentine are dead.

It is with no spirit of hypercriticism that I have made the above defence—but to sustain and advance the opinions, which a most carefully study of the histology of the present day, justifies my holding.

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#### ARTICLE IV.

#### *Proceedings of the South Carolina State Dental Association.*

Held in Columbia on 5th, 6th, and 7th of April, 1870.

By THOS. T. MOORSE, D.D.S., Corresponding Secretary.

A call having been made (by the members of an Association previously formed) for a new Association that would embrace every portion of the State, on the day appointed a large number of Dentists assembled in Columbia, and proceeded to form a "State Dental Association."

The following officers were elected to serve the ensuing year:

*President*, Dr. J. B. Patrick, Charleston; *First Vice President*, Dr. Wm. C. Wardlaw, Abbeville; *Second Vice President*, Dr. H. R. Hanbery, Barnwell; *Corresponding Secretary*, Dr. Thos. T. Moorese, Columbia; *Recording Secretary*, Dr. O. J. Bond, Marion; *Treasurer*, Dr. Tho. F. Chupein, Charleston.

The President appointed the following standing committees:

*Executive Committee*.—Drs. D. L. Boozer, G. F. Wright, A. K. Durham, N. Simms, Sam'l A. White.

*Committee on Membership*.—Drs. Wm. L. Reynolds, E. C. Jones, J. R. Thompson, B. C. Hart, Geo. H. Winkler.

*Committee on Operative Dentistry*.—Drs. O. J. Bond, W. C. Wardlaw, Thos. T. Moorese, W. S. Brown, Thos. F. Chupein.

*Committee on Mechanical Dentistry*.—Drs. R. S. Whaley,

W. A. Fallaw, H. R. Hanbery, J. H. Alexander, B. A. Muckenfuss.

The following were elected delegates to the "Southern Dental Association;" Drs. J. B. Patrick and Wm. C. Wardlaw.

Delegates to the "American Dental Association;" Drs. Thos. T. Moore and H. R. Hanbery.

The delegates to the "Southern" and "American Dental Associations," were instructed to use their influence in having a committee appointed to petition Congress to appoint Dentists in the Army and Navy of the U. S.

After a very harmonious meeting, the Association adjourned, to hold its *Semi-annual* meeting in Charleston, in Nov. next, and, its *Annual* meeting in Columbia, in the first Tuesday in May, 1871 at 8 P. M.

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## SELECTED ARTICLES.

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### ARTICLE V.

#### *Second Annual Meeting of the Southern Dental Association.*

By W. N. MORRISON, D. D. S.

The Convention of the Southern Dental Association commenced its second annual meeting on Wednesday, April 13, at 10 A. M., in the hall of the Mechanics' Institute, Dr. J. G. McAuley, 1st Vice President, in the Chair.

Dr. J. A. Thurber, President of the New Orleans Dental Society, read the welcome address, which was beautifully expressive of the sentiments of the profession in this city to the members of the convention, and was received with marked approbation.

On a call of the roll, by Dr. J. G. Angell, Recording Secretary, the following named gentlemen, active members of the Association, answered to their names:

Drs. W. H. Morgan, Nashville, Tenn.; J. R. Walker, New Orleans; Hy. A. Lawrence, New Orleans; J. G. Angell, New Orleans; G. J. Fredrichs, New Orleans; W.

S. Chandler, New Orleans; J. S. Knapp, New Orleans; W. G. Redmond, Louisville, Ky.

The committee on Membership reported, recommending the following gentlemen for active membership, and they were accordingly elected :

Drs. A. F. McLain, R. M. Lawrence, C. E. Kells, C. L. Thurber, H. Pierson, James West, S. A. Thurber, B. F. Smith, J. A. Casadavant, C. N. Sabourin, Hy. Lawrence, F. Antroux, J. R. Walker, all of New Orleans; W. Johnson, Savannah; E. A. Hermon, Nashville; R. M. Gage, and W. Denson, Mobile; E. Floyd, Fayetteville, N. C.; S. P. Cutler, Holly Springs, Miss.; T. L. Ulmer, Pleasant Hill, Ala.; J. B. Murphy, Atlanta; W. N. Morrison, St. Louis; L. E. Edmonson, Galveston; J. B. Patrick, Charleston; E. R. E. Carpenter, Chicago.

Communications from different members of the Association who were unable to attend, were read, and after some other business of minor interest, the Convention adjourned until 8 o'clock P. M.

*Evening Session.*—Dr. McAuley in the Chair,

The following gentlemen were duly elected permanent members :

T. J. Freidrichs, C. W. Robinson, F. H. Knapp, J. A. De Hart, J. S. Cobb, J. M. Magee, W. N. Morrison, E. R. E. Carpenter.

The Committee on Dental Education, Dr. Gorgas, the chairman, being absent had no report prepared.

Dr. F. Y. Clark read an interesting paper on the subject of appointing dentists in the Army and Navy. The report was received, and approbatory remarks made by Drs. Morgan, Freidrichs, Walker, Magee, Cutler and Cassadavant.

Dr. Ford offered a resolution that the President appoint two delegates to confer with and request the American Dental Association to appoint three members to memorialize Congress on the subject.

On motion of Dr. McLain, the Convention adjourned until 10 o'clock, A. M. Thursday.

*Thursday, April 14.*—The Convention met pursuant to adjournment; Dr. McAuley in the Chair. Minutes of the previous day were approved.

Drs. G. H. Kirk, of Tuscaloosa, Ala.; T. H. Harrison, Morton, Miss.; were upon ballot elected members.

Dr. Clark read an instructive paper on operative dentistry, and Dr. Morgan one on capping exposed pulps, and on heavy foils.

Dr. Cutler made some remarks on histological conditions and secretions of pus at the root of teeth, and spoke at length and with great interest on microscopical researches.

Dr. Morrison was appointed Corresponding Secretary, and Dr. Thurber, Assistant Secretary.

Dr. Cobb spoke next of the peculiarities of diseased molars, instancing a case of failure, resulting in pyæmic fever in a patient who was but twelve years old. Dr. Cutler expressed the opinion that it was caused by the tunnel-shaped opening at the foramen being imperfectly filled. Interesting remarks were also made on the subject by Drs. Magee, Clark, Walker and Ford.

Dr. McLain thought these ulcerations were induced by arsenious acid, devitalizing the pulp, and that this acid was absorbed to a much greater extent than was supposed.

After other remarks by gentlemen, on a variety of subjects of minor interest, the Convention adjourned till 8 o'clock, p. m.

*Evening Session.*—The President in the Chair.

Charleston, S. C., was selected as the place of the next annual assembly, on the 2d Wednesday of April, 1871.

The Convention adjourned till 10 A. M., Friday.

Previous to the daily sittings of the Convention, we noticed interesting dental operations by Drs. Clark, Carpenter, Shadoan, of Louisville, and others of the Association.

*Friday, April 15.*—The convention met pursuant to adjournment, Dr. Morgan acting President.

Dr. J. S. Knapp read an interesting paper on the subject

of wasted alveolar processes and gums, their treatment, etc.' by Dr. W. H. Atkinson, of New York.

The merits of the paper were discussed at length by Drs. Taft, G. J. Freidrichs, J. R. Walker and others.

Dr. Herman, of Nashville, mentioned a difficult case of alveolar abscess, in which he had used the usual remedies unsuccessfully.

Dr. J. S. Knapp, advised the use of creosote in alternation with chloride of zinc.

Dr. Clarke, of Savannah, recommended carbolic acid, iodine and glycerine.

Meeting adjourned at half-past two, P.M., to attend the dinner given by the New Orleans Dentists, to the members of the Association, at the Washington Hotel, Lake Pontchartrain. Representatives of the press, and quite a number of ladies were present.

The tables were handsomely decorated with flowers and each guest was presented with a bouquet. Wines of the finest brands in abundance. Strawberries, bananas and other native and tropical fruits were especially enjoyed by the assembled company.

The affair passed off most entertainingly. A number of toasts were given, to which appropriate responses were made by Dr. F. H. Knapp, and Dr. J. A. Thurber, who respectively occupied the ends of the table. Drs. Taft, Casadavant, Walker, Morgan, and others of the profession, were called out and made very pleasant little speeches. Also, representatives from the medical profession and the press, responded to their calls.

One of the most pleasant features of the occasion was the presentation of a elegant gold-headed cane, by the Association, as a mark of esteem, to Mr. Samuel Hape, of Atlanta, Ga.—Dr. Morgan making the presentation speech.

*Evening Session.*—On re-assembling, at eight o'clock, as per adjournment, the members all felt in such good humor that Dr. Patrick called for Dr. Cutler to sing, "Shoo Fly," with the Association to join in the chorus.

Dr. Angel introduced a resolution that the Association take into consideration the importance of establishing a Dental Journal, South; which was adopted.

Dr. Angel, being called upon, then expressed his views, as chairman of a committee from the New Orleans Dental Association, of the importance of having an independent journal established.

Dr. Morrison of the "Missouri Dental Journal," and Dr. Taft of the "Dental Register," being called upon, gave their views upon the subject. They fully concurred in the opinion that there was room for another journal. Other members entertained the same views, and a committee of five, consisting of Drs. J. S. Knapp, (La. ; ) A. C. Ford, (Ga. ; ) J. B. Patrick, (S. C. ; ) W. H. Shadoan, (Ky. ; ) and R. M. Gage, (of Ala.) was appointed to take it into consideration and report at the 10 A. M. session on to-morrow.

Dr. Cobb asked if it was possible for bad teeth in any way to produce cancer.

He was answered negatively by Drs. Clarke, F. H. Knapp, J. R. Walker, McLain and Magee.

Dr. Cutler was of the opinion that they might do so.

Dr. B. F. Smith read an excellent essay on the "Past and Present of Dentistry."

On motion of Dr. Walker, the meeting adjourned until 10 A. M. to-morrow, when the subject of Mechanical Dentistry was to be taken up.

The clinic operations this morning were of a very interesting nature. Dr. J. N. Knapp, operating in the mouth of Dr. McAuley, the President of the Association, made, in the handsomest and most skillful manner, a compound filling, with cylinders. The operation, and the manufacture of the cylinders by Dr. Knapp, were watched with great interest by the assembled members of the profession.

Dr. Shadoan, of Louisville, also made a handsome front filling for Dr. Clark, of Savannah.

*Saturday Morning.*—Association called to order by Dr. McAuley.

On motion of Dr. Cutler, reading of the minutes was dispensed with, and the subject of Mechanical Dentistry was called by Dr. Walker, who thought rubber work had been a curse to the profession.

Dr. Taft thought mechanical dentistry should be separated from the operative entirely.

Dr. Cutler wanted a higher style of mechanical dentistry under the direction of the operative dentist. After remarks from others the subject was closed and miscellaneous business taken up. It was ordered that three hundred copies of the Constitution, By-laws, and Proceedings of the Association be printed, and one hundred be bound for immediate distribution.

At twelve o'clock the election of officers for the ensuing year resulted as follows:

President—Dr. James S. Knapp; 1st Vice President—Dr. F. Y. Clark; 2d Vice President—Dr. E. A. Herman; 3d Vice President—Dr. L. E. Edmonson; Corresponding Secretary—Dr. W. N. Morrison; Recording Secretary—Dr. John G. Angell; Treasurer—Dr. W. G. Redmond; Executive Committee—Drs. J. B. Patrick; G. Taff; A. M. Ford; W. S. Chandler, and Samuel Rambo.

The following named gentlemen were also elected Delegates to the American Dental Association, which meets in Nashville on the first Tuesday in August: R. N. Lawrence; — Holmes; J. R. Walker; A. F. McLain; J. B. Patrick; R. M. Gage; E. Floyd; W. H. Burr; S. G. Holland; H. A. Lawrence; F. Anfoux; Louis Augspath; B. F. Smith; J. B. Murphy; L. E. Edmonson.

After a vote of thanks to the members of the press, hotels, railroads, steamers, and retiring officers, the Association adjourned to meet in Charleston, S. C., on the second Monday in April, 1871.

## ARTICLE VI.

*Allen's Continuous Gum Work.*

BY T. HASBROUCK, D. D. S.

There is so little said or written on this subject, that it seems to have been almost entirely neglected of late, not only in the dental schools, but in the columns of the journals. Continuous gum with a platina plate properly put up is, in the opinion of the writer, the most perfect thing in the way of artificial dentures that has ever been produced. This will, no doubt, appear to some as a very broad assertion, on account of their having seen very ugly looking specimens of the work in some mouths, and other objections have been its weight and liability to fracture when dropped. Others, that are not unfrequently urged are, that it is impossible to mend it after it is once broken, and that the plate will warp in baking, and consequently be a misfit when completed. All of these objections would be good ones if they had any foundation in fact, which any man who has a thorough knowledge of the work can easily demonstrate to be untrue.

We have seen a great number of cases of this work that were improperly made, and such coming under the observation of any good dentist, would very naturally give him the impression that, practically, continuous gum work is worthless, unless he happened to know how it *should* be done. There is but one way to do anything, and that is to do it right, and if this work is done in that way, it will be just as strong and durable as any, and much more natural and cleanly than any I have ever yet seen.

The plate, for a practical case, should be about No. 28, by gauge, and the French platina is preferable on account of its being smoother, brighter, and less likely to have cracks and fissures in it than that which is made from scraps and rolled out. The plate should be swaged in the same manner as an ordinary metal plate, being careful to keep the base metals from it in annealing. Get the articulation the same



as in any case, and the teeth can be placed in most any position required. After they are arranged on the wax as desired, it is well to put plaster enough around the outside to hold them firmly in position while being backed and soldered.

Then invest in plaster and asbestos, first putting a platina wire across the heel of the plate to keep it from warping or springing while being baked. The backing should consist of about three separate pieces of platina, and cannot be too stiff or strong; solder with pure gold. It should not be soldered in the furnace, as the teeth will be very likely to be etched and spoiled by overheating while in the investment.

Heat them to a cherry-red in the furnace, and then melt the solder with the blow-pipe. After cooling off remove the investment, taking care to preserve the base with the wire in it to bake the piece on afterward. Put the piece in acid to remove the borax, and then wash thoroughly with soap. The case is then ready for the body. After the first coat, the cracks and fissures caused by the shrinkage must be carefully filled, and it will come out of the furnace the second time smooth and ready for the enamel, which can be put on thick or thin to suit the case, and shaded as desired.

The baking and furnace work is the most difficult part, and can only be learned by practice. There are many little annoyances that the beginner has to put up with, and gasing is perhaps the worst one. If it is heated up too fast it will snap and fly. If the case is gased, it is ruined, and might as well be made over at once. It will look blue, and be rough and spongy. A little practice and instruction from any one who understands it will enable one to overcome all these difficulties. As for the work breaking down easily, it will not do it in the mouth, and is no more likely to fracture than any other, unless dropped on marble or some other hard substance. If a patient has the misfortune to drop and break them, they can be repaired just as easily as any other work, and can be mended to look well, though, generally, after being mended two or three times they are not so

strong as at first. The same may be said of almost any work.

To those who are fortunate enough to know how to do this work, this will, of course, be without interest. It is meant for those who do not, of whom, I am well aware, there are a great many in our profession. I do not wish to convey the idea that continuous gum is better than anything else, but have said these few words, hoping that there may be some interest awakened in its behalf, and am very sure that whoever takes it up, masters it, and uses it properly in his practice, will never have reason to regret it. I would not recommend its use for partial plates, but for entire upper, or under, or both, I think it is without any equal in most cases.—*The Dental Times*.

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## ARTICLE VII.

### *Vulcanite Combinations.*

BY W. GEO. BEERS, MONTREAL.

The exclusive use of either red, black or pink rubber, as a base for artificial teeth, have their separate objections. Certain objections to the red may be removed by the use of the brown or black, but the color of these is a strong argument against their use with many patients. The pink compounds would seem to fill the void; but all the light shades of vulcanite are inferior in strength and durability to the red or black, having a much smaller percentage of caoutchouc, and a larger amount of earthy matters or metallic oxides, used to tone down the original color. In 100 parts of the best English pink there is a percentage of 60 parts of fixed matter, while in the best red and black there is, in 100 parts, only from 3 to 6 of this objectionable foreign matter. The consequence is, that the worst colors are the best for all purposes. The following is the method I use for obviating the separate objections referred to, while combining any separate excellence they possess.

Put a sheet of red or black rubber in boiling hot water, and when softened, pass it through rolling mills, until it is

reduced to half its usual thickness. It is better to cut the sheet in two longitudinal strips previous to rolling, as the rolling widens the sheet, and it is liable to catch and tear at the sides. If for instance, the case is an upper set, make a paper pattern of the palatine surface of the model, keeping at least a quarter of an inch from the pivots of the teeth, and the back part where the plate is to terminate. Cut the red or black rubber to correspond with this pattern, and place it on the palatine surface of the model, over the air chamber. Now take strips of pink rubber, and pack them regularly under the pivots as the teeth lie in the flask. Cut a piece of pink rubber a quarter of an inch wider in circumference than the red piece, and place it properly in the part of the flask containing the teeth. Pack red rubber around the pivots, and sufficient pink elsewhere to prevent red oozing through, and wherever it is necessary. The result, of course is that you have red vulcanite for strength on the upper palatine surface where it does not show, and pink on the lower or visible surface. Nothing makes a handsomer "rubber" set than the two layers combined. In preparing the set for the flask, I always alter the wax to come up high to the back of the crowns of the teeth so that the depression thereby caused in the plaster, will accomodate sufficient pink rubber to prevent any red passing through. The wax model should be smoothened as well as possible, and every precaution taken to avoid much use of the bur when finishing.

I think the above method is better for all purposes than the entire use of pink rubber, as it gives the upper palatine surface of the plate the most durable, and the lower surface the most beautiful.—*Canada Journal of Dental Science.*

## ARTICLE VIII.

### *Filling Teeth.*

#### CASE I.—PREPARATION OF THE CAVITY.

The right upper 2d molar has a shade of discoloration, showing on the posterior portion of its triturating surface.

The tooth lies closely to the 3d molar and has no appearance of decay near the grinding surface. The teeth are to be separated now with a wedge nearer the gum, and a delicate excavator does not discover a cavity near the grinding surface, but softened enamel is perceived near the cervical portion, cutting like hard chalk.

The patient's mouth is small, if it was larger I would cut a dovetailed slot, with small hoes and hatches, from the *buccal* surface of the tooth, to the cavity. But in this case the mouth is too small for the proper manipulation of instruments, and therefore I proceed in the following manner :

With a crescent drill make a canal from the *grinding* surface of the tooth as directly upwards towards the cavity as possible. It must be *very* near the posterior approximal surface. Near the cervical portion the drill enters the softened dentine. I now cut out the thin portion of dentine between the canal which I have made and the posterior approximal surface of the tooth, leaving an open canal, a section of which when finished must exhibit a "dovetail."

This open canal must correspond in diameter to that of the cavity of decay.

#### TO KEEP THE CAVITY DRY.

Wedge, to press back the gum at the cervical portion, or a bit of spunk crowded between the teeth at this point. A bit of spunk an inch square over the parotid duct of the same side held by a compressor. Sheet rubber laid over the lips and under the teeth as far back as convenient; over which is a thin white napkin to reflect light into the cavity; the gold contained in the plugging pliers will not get wet in being introduced, by any efforts of the patient in swallowing.

#### INSERTING THE GOLD.

Make two cylinders of soft, unadhesive gold, whose diameter shall each be a little more than half that of the cavity, and whose length shall be a little more than its antero-posterior diameter. Place one of these cylinders within the cavity so as to allow one end to press against the adjoining

tooth. With a foot-shaped plugger carry this cylinder about half way to the bottom of the cavity, then press it sidewise and carry the other cylinder to its side. With a little larger foot carry the whole of the gold *homs*, and mallet it down. It can hardly be compacted too much. If well done the margin of the cavity nearest the alveolar process will be covered with gold and thoroughly protected. If the cylinders press well against the adjoining tooth they will remain *in situ* while more gold is added to them.

Add to the gold surface now made a thin layer of Morgan's plastic gold and condense thoroughly with very shallow and sharp instruments. Now cut No. 30 into narrow and short strips, and fill the remainder of the cavity, all the time keeping the plug against the adjoining tooth solidly. If this is done the teeth will be separated considerably by the time the operation is through. When near the surface use No. 60 in small square pieces and very small pointed pluggers. The gold may now be filed out which is pressed between the teeth and thoroughly polished.

#### POLISHING.

No plug can be well polished which is not dense. It must be uniformly dense near the surface. Deep serrated pluggers must not be used if a good surface is desired. It is impossible to fill the pits or obliterate them. They may be partly closed by condensing with a small smooth point for a long time.

Bring the surface down to the desired level with burrs and scrapers. If the gold has been properly condensed, it will cut like a solid piece of coin, and appear so also under the magnifying glass after burring it.

A deceptive polish may be made by using the burnisher, but it is only a thin film of gold which is thus made smooth, and which will in a few weeks wear off and show a rough surface.

After burring and scraping the plug, use pumice stone and a stick for quite a long while. Wash off the pumice from

time to time and examine the margin. Form the latter to a continuous even line if possible, with a sharp excavator, or crescent drill, and then pumice it again, Pumice stone makes an *honest* and good finish; good enough in fact for all practical purposes for plugs that are not conspicuous. But we need not grudge a few minutes with chalk after the pumice. Prepared chalk on a soft stick for grinding surfaces, and chalk on chamois for approximal ones, will give a beautiful surface in a very short time, provided it has been sufficiently pumiced. A few drops of alcohol added makes it more agreeable in the mouth.

As it is not pleasant to the patient generally, to have these powders falling on the tongue, it is very proper to place a small napkin in such a way as to catch them, while polishing. CHASE.—*Missouri Dental Journal*.

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#### ARTICLE IX.

##### *Loosening of the Teeth.*

BY LEON F. HARVEY, A. M., M. D.

READ BEFORE THE BUFFALO DENTAL ASSOCIATION.

The loosing of the teeth, its causes and treatment, will claim our attention for a few minutes this evening. Very little can be said on the subject, for but comparatively little is known. We all know how sad it is to see fine, healthy teeth—healthy so far as freedom from decay is concerned—one after another, loosen, and finally, in many cases, actually drop from their sockets without the aid of the dentist, and we must stand by and see the ruin, powerless to effect a cure.

We do not often see this disease until after the patient has passed the age of forty-five. It is the exception and not the rule if it does occur in the young. We find it in the strong and healthy as well as the weak and sickly. If we recollect right, it occurs more frequently in the male than the female, though we presume some writers and probably some present, would differ with us. With some the des-

truction is very rapid, whilst with others it takes years to effect the removal of all the teeth. We here cite a case related in the *Dental News Letter*, Vol. 8, page 128, showing the rapid progress of this disease:—

“*Case of Diseased Aveoli*, by FRANCIS CAMERON, M. D., Springwood, C. W.—What I conceive to be a rather rare case of disease and one interesting to the profession, occurred in my practice some years ago. Daniel Young, aged about seventy years, consulted my medical preceptor for a disease (as he called it) of the roots of the teeth. The doctor finding it likely to prove tedious, committed it to my charge to manage under his advice. Our patient stated that he first experienced a soreness at the roots of one or two of his upper molar teeth, which shortly after became quite loose, and concurrently with the supervention of the dental looseness, a purulent discharge set in from the gums around them. The affected teeth were removed, a feat which was very easily performed, and a lotion of myrrh and borax applied to the affected gums. After the separation and removal of the diseased alveolar processes, the soft parts, under this application, soon healed. No sooner, however, had one place healed, than the disease broke out in another. It thus spread from tooth to tooth in both jaws, until all the teeth were lost and their sockets destroyed. After this he got well and lived for several years in comfortable health. Perhaps some of the readers of the *Chronicle* would enquire had he taken mercurials previously? I believe not, as his health was good for a long time before. The entire period the disease took to travel round his masticatories and disappear, was three weeks.”

We should be inclined to think that this person when young had taken mercurials in some form. It is certainly a very interesting case, from the fact that the progress of the disease was so rapid.

The following is the account of a case which has lately come under our observation. But three teeth were affected

and we trust that a cure has been made, though time may show us the contrary result :

A gentleman about the age of fifty complained of his teeth growing loose, that they were sore, as also were the gums around them. A fetid odor, due to purulent matter, was manifest. On examination, found that the gums were very much inflamed ; that the inferior lateral incisor, the adjoining cuspidatus and the first molar of the same side, were quite loose. The tumefaction was very great. Treated the parts for some time with local depletion and the application of iodine and creosote. The patient being in good health no constitutional treatment was needed, and we considered the disease purely local. No good effects followed, and the extraction of the teeth was the last resort. Now, at the expiration of two or three months, the gums have assumed a healthy appearance and there is every indication that the disease has been arrested.

What are the causes of this affection will naturally be asked.

It may be hereditary. Ask patients whose teeth are becoming loose, if their parents lost their teeth in the same way, and some will say, yes ; and also remark one or the other of their grand-parents were troubled in the same manner.

Syphilis is another cause, but that is not to be wondered at, for it attacks all the osseous structures of the body, and why not those of the mouth. Mercury, perhaps, administered years before the commencement of this disease, is often the cause.

A recent case of this kind occurs to us. A young man of the age of twenty-eight came to us in great trouble, for his left superior lateral incisor was getting quite loose ; there being hardly any bony attachment, the gum around it being very much swollen and pus exuding from it. Used the usual treatment, but with no success ; the case was too far gone for remedies, and the tooth dropped out. He had been suffering for a long time with catarrh and other affections,



and his physician had him under a course of treatment. Soon the right lateral began to show signs of a desire to part company with him. This also, was treated in the same way, but he leaving the city, the treatment was discontinued. We have since learned that the physician now attending him ascribes all his troubles to mercury he took when young, and is treating him for the removal of the poison. The tooth, we are informed, is growing firmer, but we have no faith that it will be sound. Before he left here we had thought mercury might be the cause, but had no time for constitutional treatment, and his other affections claimed immediate attention from the physician.

Phosphorus, as used in the manufacture of matches, causes the loss of many teeth, but a distinct disease is observed here, having its own individual treatment. Blows on the teeth or gums may be an exciting cause. Tumors, malignant or non-malignant, will produce absorption of the alveolar process, and thus the teeth may be loosened. Mental exhaustion ; a disordered stomach, are mentioned as causes.

Persons residing in malarial districts, who have taken large quantities of quinine, are victims of this disease, as are also the dwellers in low and damp places, such as the cellars of our cities.

Scurvy is often found to be the cause, but we do not meet with it as if we were practitioners in a seaport town where we would come in contact with sailors who often are troubled with scurvy. It is often found in women during pregnancy and about the cessation of the menses. Persons in whom tubercular consumption is manifest sometimes have this affection of the gums, but there may be no progress of the disease of the lungs till all the teeth are removed. It seems to act very much as an issue or seton. M. Oulet considers the disease beneficial in that the purulent discharge tends to suspend some more serious disease. Scrofula can also be found tampering with the teeth ; retrocession of cutaneous eruptions, cessation of hæmorrhoidal discharges, are sometimes followed by a loosening of the teeth. Jourdain names

it conjoint suppuration of the alveoli and gums. Our observation will not allow us to say in what teeth it is first observed, but the books say that the incisors are first attacked.

Dr. Harris mentions a form of this disease met with in persons of scrofulous habits, which he thinks differs essentially from the more common affection. In this case, the gums instead of being purple and swollen, are paler and harder than ordinary, and on being pressed exude a mucopurulent matter of a dingy white color. They often remain in this condition for years without appearing to suffer any loss of substance or to affect the alveolar process. This variety of disease of the gums is principally confined to persons who have very white teeth, and is much less likely to affect males than females. It rarely occurs before the age of eighteen or twenty, and though unquestionably the result of inflammation, the gums exhibit no inflammatory symptoms, but on the contrary are paler, less sensible, and possessed of less warmth than usual. It is never attended with tumefaction of the gums, and by absorption only in its advanced stages. Its effects are the most simple and innocent of any form of disease to which the gums are liable, but its cure is generally difficult.

Constitutional remedies, such as proper diet, exercise, air, and clothing; iodine, cod liver oil, should be prescribed. At the same time the edges of the gums should be touched with nitrate of silver.

We have introduced this form which can hardly be said to relate to the disease we have under consideration, as it is more a disease of the gums than a joint affection of the teeth and gums, to prove an aid sometime in the forming of a diagnosis.

The accumulation of tartar around the necks of the teeth and along the course of the roots, by its constant presence, produces irritation and consequent inflammation of the gums, and the alveolar process becoming involved, necrosis takes places and the teeth are lost. The deposit is more frequent when the stomach is disordered.

In some mouths we find the indications of inflammation, heat, pain, redness and swelling, and added to that pus exuding from the free margin of the gum. The breath is offensive, the patient complains of soreness at the roots of the teeth, the gums bleed on pressure ever so light; with extraction of the teeth the pain is intense and the hæmorrhage profuse. When this condition exists it is pretty certain that the process is nearly if not entirely absorbed and the only attachment the gum.

We have another condition which in our mind is the most dangerous, yet the condition of the mouth at the first glance would not warrant such an assumption. There will be but little or no indication of inflammation; very little, if any, pain from the teeth themselves, but seldom, exudation of pus; no bleeding of the gums upon touch, and but little on extraction of the teeth, with but slight pain; the walls of the sockets are slowly but surely absorbed, and the teeth are finally lost. With the first form, if the disease has appeared in but two or three teeth, we are more certain to arrest it if the cause is local, but with the second, one tooth after another is lost, almost without an exception.

We consider the second form the most difficult to treat, for we have nothing tangible to seize hold of. Where there is inflammation present the medical man knows what course to pursue, but if all the symptoms are obscure or if there is none, and yet there is disease present, but in a hidden form, he is baffled in his treatment. So it is in these two forms; the first shows a bold front and we can use vigorous measures to effect a cure, but we are sorry to confess the cures are very few. The second is like some of the old chronic cases in hospitals, remedies, have no effect upon them.

The indications for treatments in the first form, if the cause is local, are the removal of the cause; if it is due to the presence of tartar, every particle must be removed; if the inflammation is acute, the disease making rapid progress, the free use of cathartics, astringents and possibly the application of nitrate of silver. Depletion of the gums often is

beneficial. The gums may be painted with iodine or a mixture of iodine and creosote. If the disease is of a chronic form, astringents should be used, tannin, myrrh, and a mouth cerate composed of nutgalls, blackberry root and honey, alternating them every two weeks. If the patient is in a low state of health, tonics should be prescribed.

When the cause is constitutional the treatment should be directed to the removal of the disease that may have brought on this affection. The teeth may often be kept secure for some time by using silver wire or surgeons' silk, binding them together.

Fintoll relates the following case:

"As an example of the trickery to which the public are subjected by its patronage of this class of dentists, permit me to digress a little in recounting the history of a case which I will preface with an extract from a daily publication:

"Loose teeth securely fastened whether arising from old age, neglect, the use of calomel, disease of the gums, or any other cause, etc., etc."

A lady advanced in years consulted me. Her lower front teeth had, by the progress of absorption of the gums and sockets, become very loose. She had yielded to the fascinations of some such advertisement as that above, and had had her teeth "securely fastened!" and so indeed they were. From the appearance which they presented I concluded that a mass of metallic amalgam miscalled "mineral cement," had been taken between the finger and thumb of the operator and pushed into and between and upon the loose teeth, tartar, decayed bone, diseased jaws, etc., just as a plasterer would take a dab of mortar on his trowel and stuff it pell-mell into the crevices of a clump of loose brick. The amalgam soon hardened and formed what I can only describe as one irregular, rough and misshapen mass, made up of the four loose lower incisors, and the two canines, these two last named, as is often the case, being comparatively firm, and forming props of support to the cement. The result of this plastering dentistry had been extensive inflammation of

the gums and neighboring parts, internally as well as externally, and the patient was undergoing excessive pain and inconvenience. She was desirous that I should remove the fastening, but as I could not do so without removing the teeth also, and as she was not prepared to submit to this, she left me, and I have since lost sight of the case.

The cure of this disease that we have been considering is so important that we hope the time will come when we shall be able to stop the fearful ravages that are going on in the mouths of our patients. All we can do is try one remedy after another, with the hope that we may do some good.—*The Dental Advertiser.*

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## ARTICLE X.

### *Dyspepsia—its Causes and Cure.*

Dyspepsia has too often been called an incurable disease, the opinion arising, no doubt, from a misappreciation of its causes, and the treatment necessary to its cure. Probably often, also, from the lack of patience on the part of the one afflicted, in the use of the remedies necessary to accomplish the desired end; for, be it remembered, time and patience will be tasked severely in removing the cause, ere the cure can be effected.

It is caused less frequently by over eating, or errors in diet than is generally supposed; it arises more frequently from irregularity in habits of body, as taking of meals, evacuating the bowels, etc.

Nervous disorders are perhaps the most prolific source of the evil, and these, in their turn are induced by over work, worry, confinement, bad air, and insufficient food. The remedies are obvious: plenty of sunlight, exercise in the open air, care being taken not to exercise so violently as to cause weariness, a generous diet, and plenty of sleep, which is emphatically food for nerves—more benefit being often derived from a short nap before dinner to rest the stomach, than much medication.

When the trouble arises from gastric irritability, as it often does, care must be exercised in suiting the diet to the enfeebled powers of the digestive apparatus.

Sub-nitrate of bismuth, in doses of from five to ten grains, after eating, has usually a very salutary effect. Tonics and mild stimulants are also indicated to increase the appetite, and give tonicity to the nervous system generally. Above all, let the dyspeptic take his meals at stated intervals, absolutely abstaining from all food between meals.

Let there be variety in his food, good beef, chicken, mutton, oysters, eggs, good light stale bread, white or brown as he may prefer. This, with just sufficient exercise to aid and not impair digestion by fatigue, will almost always relieve the worst forms of the disease. Care should be exercised also in regard to locality, as low, damp, or deeply shaded spots will inevitably tend to depression. Change of scene and air is also highly beneficial; traveling by sea or land will often effect a cure. The nervous dyspeptic will do well to acquire the habit of loafing, for, to him, rest is more beneficial than exercise. Sunlight is, however, the most powerful agent known, frequent sunbaths sweetening and invigorating both the invalid's temper and digestion.

General electrization has of late years become a very popular and efficient remedy, but requires time and perseverance to secure its effects, as, indeed, does every one applicable to the peculiar forms of this disease. Perhaps a more efficient aid to all remedies is the caution in regard to dress, especially among fashionable females. Gastric irritability and consequent weakness is sure to follow the cruel practice of compressing the waist, especially when the modern corset must be supplied with an inflexible support, the lower extremity of which presses directly upon the stomach, and acts as a source of constant irritability. The monstrous belt buckle, also, as unyielding as metal can make it, is a cunningly devised instrument of torture. The cure for this evil, of course, is simply to allow nature to fashion the bust, and be content therewith.

Dr. Baird gives the following rules to be observed by the dyspeptic: Never exercise hard before breakfast, nor, indeed, before or after any meal; take the exercise you most enjoy; never exercise to absolute exhaustion; to which might be added, never starve yourself—let your diet be light, but abundant.—*Oregon Med. and Surg. Journal.*

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## MONTHLY SUMMARY.

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*Convulsions.*—In these cases, the effect of oiling is sometimes truly surprising, the fit ceasing before the completion of the operation, and not subsequently returning. A patient informs me that whenever she observes the symptoms which used to precede convulsions in her boy, she at once oils him, when a calm sleep follows, from which the child wakes up refreshed.—*Dr. Knaggs. Medical Gazette.*

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*Strychnia an Antidote to Chloral.*—Liebreich has recently demonstrated the curious fact that a poisonous dose of strychnia counteracts the effects of chloral, by the following experiments:

A subcutaneous injection of two grammes of chloral in a rabbit (about equivalent to 100 grammes for a man of ordinary size) produces speedy collapse and death in about half an hour; an injection of .0015 gramme of strychnia in a second rabbit, causes tetanus and death in about twelve minutes; if to a third rabbit, however the same dose of chloral be administered and followed, when it begins to act, by the same dose of strychnia, the animal soon revives, and in an hour and a half gets on its legs and feeds as usual.—*Medical Gazette.*

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*Methylic Ether as an Anæsthetic.*—At the Medical Society of London, on Monday night, Dr. Richardson made a communication on the application of methylic ether as a general anæsthetic. Methylic ether is made by mixing one part of sulphuric acid with two of pure methylic alcohol, and applying the heat. The ether passes over as a gas, having an ethereal odor, and a vapor density of 23, taking hydrogen as unity. To fix the gas, Dr. Richardson passes it slowly through pure ethylic ether, of specific gravity .730, and boiling point of 95° Fahr.: the gas is

being absorbed for several hours, and the result is an ethylic ether saturated with methylic. This is the fluid employed for anæsthesia. Two drachms of the fluid are poured upon domette in a simple mouth-piece, which also covers the nostrils, and the vapor from the surface of the domette is directly inhaled. Dr. Richardson reported eleven cases of tooth extraction in which he had successfully anæsthetised with methylic ether, at the National Dental Hospital; and since monday, Mr. Gregson has used it at the Dental Hospital of London, also with great success. Two peculiarities, at least, may be mentioned, as pertaining to the action of the new carnotic:—(1) That it produces quick relaxation of the muscles; (2) That while the patients under its influence are unconscious of pain, they are capable of performing what appear conscious acts, which acts on recovery are entirely forgotten. The anæsthetic sleep is induced usually within a minute and a half, recovery being perfected as quickly; in no period of the anæsthetic is there asphyxia, and the pulse undergoes little alteration. In short, from the experience as yet obtained, there is promise that, for short operations at all events, methylic ether will fill an important place in our list of remedies. The chemical composition of the ether is  $(CH_3)_2O$ —*Lancet*.

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*Recipe for Burns.*—Make a saturated solution of alum (four oz. in a quart of hot water.) Dip a cotton cloth in this solution and apply immediately on the burn. As soon as it becomes hot or dry, replace it by another. and continue doing so as often as the cloth dries, which at first will be in a very few minutes. The pain will immediately cease; and after twenty-four hours of this treatment, the burn will be healed, especially if commenced before blisters are formed. The astringent and drying qualities of the alum will entirely prevent their formation. The deepest burns, such as those caused by boiling water, drops of melted metal, phosphorous, gunpowder, fulminating powder, etc., all have been cured by this specific.—*Chicago Medical Journal*.

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*Syrup Ether.*—This preparation is much used in France, in cases where the employment of ether is indicated; it will be found especially useful in sick headache. The following formula furnishes a syrup rich in the medicinal principle, of a fixed com-



position, and which is not disturbed by the variations of temperature: Introduce into a flask 44 grains of sugar; 49 grains of distilled water; 5 grains of alcohol, 90°: and 2 grains of pure ether. Agitate and preserve.—*Eclectic Medical Journal*.

*Lactic Acid in Croup*.—R. Acid lactici gtt. xv ad gtt. xx; aq. 3 ss M., may be used to advantage in croup. This quantity to be used every half hour with an inhaling apparatus, diminishing the acid to gtt. x, then to gtt. v, and inhaling it but every half hour for two hours, when the dyspnœa decreases, which is said to disappear entirely in seven, ten or twelve hours. Protect the eyes and face from the vapor. Dr. Webb prescribes, beside, this local treatment, the following internally: R. Sodæ bicarb. 3 ij; aq. 3 iv. M. Sig. A tablespoonful every half hour, or every hour, till the dyspnœa disappears.—*Medical Gazette*.

*Valuable Combination*.—A correspondent, Dr. C. W. DAVIS, of Iowa, writes; "Sulphate of zinc and chlorate of potass. intimately ground together in equal quantities will be found a most satisfactory remedy. The various forms of stomatitis, sore throat, ophthalmic, and many cutaneous diseases, yield at once, by its use. I was led to make this combination to economize space in my vial case. Instead of carrying both the zinc and potash, I carry the combination. Even in internal administration the zinc adds to the efficiency of the chlorate.

Ten grains to the oz. of water as a collyrium. 1 drachm to 4 oz of water as a wash in stomatitis, and gargle in sore throat, to be used stronger if necessary as a lotion. The zinc and potash must be most intimately ground together to an impalpable powder to insure its perfect and certain efficacy. From the efficiency and curative power of this combination there is evidently a *physiological* affinity."—*Medical and Surgical Reporter*.

*Ergot to Arrest Excessive Perspiration*.—Dr. Christman, it is stated, in the *Wurtemb. Med. Corresp. Blatt*, 1869, No. 20, has seen in many cases of excessive perspiration, a diminution of the cutaneous discharge ensue promptly upon the exhibition of ergot (8 to 10 grammes four times a day)—*Centralblatt f. d. Med. Wissenschaften*.—*American Journal of Medical Sciences*.

*Charcoal.*—Carbon in proportion to its porosity, possesses the power of absorbing many gases in an equal degree. It takes up but little hydrogen, much more oxygen, a large quantity of sulphuretted hydrogen, and a still greater quantity of ammonia. Hence charcoal is correctly used to remove bad smells from rooms, or to prevent the air in them from being contaminated by the effluvia from offensive diarrhoeas, dysenteries, foul ulcers, etc.

To effect the first purpose, small doses of charcoal should be given internally several times a day, and some should be put in the bed-pans, etc. The most effectual way of applying charcoal to foul sores, is to fill small flat muslin bags with it in a finely granulated form, and to place these on the poultices which cover the ulcers. There is no doubt whatever of the efficacy of this method; while it may reasonably be doubted whether charcoal, after it has been thoroughly moistened, and its pores filled with moisture, when it is mixed in a poultice, has not lost all its power to absorb gases, and so to act as a deodoriser. It is supposed that the oxygen which is condensed and thus accumulated in the pores of charcoal, combines with the other gases with which it comes in contact, and removes their smell by destroying their composition. When charcoal has lost its power to condense or destroy gases and thus loses its deodorizing properties, it may regain them by being exposed to a dull red heat.

Charcoal also has the power to precipitate or carry down from many solutions various coloring matters, and some bitter substances, alkaloids, and mineral matters. Hence Dr. Garrod has recommended it in poisoning by corrosive sublimate, arsenic, morphia, strychnine, belladonna, &c. It also precipitates the coloring matter of urine, and at the same time carries down all the uric acid, and some of the urea, but none of the sugar which is contained in diabetic urine. For these purposes animal charcoal is the best.

It is given with very great success in certain diseases of the stomach, in which its good effects cannot rationally be ascribed to a mere mechanical influence. Thus, it is said to ease the pain of many painful gastric affections, such as chronic ulcer, and neuralgia, and also to check heartburn. But its action is most pronounced in flatulence which it very greatly lessens, and also removes the extreme depression of spirits which accom-

panies it. It also appears to check the flatulence which arises from the irregular fermentation of food, and the hysteric form which may not be connected in any way with changes in the food.

Most of the charcoal which is taken passes out of the body with the fæces, but a little is said to find its way into the blood, lymphatics, and glands.

It may be given mixed with equal quantities of magnesia bismuth.  
—*Medical Gazette.*

*How to Detect Adulterations in Candy.*—A number of wholesale candy manufacturers in New York city have united in recommending the following as a simple means of detecting injurious substances in candy, etc. :

Any person may analyze lozenges, opaque candy, or sugar plums, by simply dissolving in water. If the water remains transparant, the candy is pure ; but if milky or depositing a sediment, terra-alba or some equally harmful adulteration has been used. The above experiment will not, however, be necessary to convince any one that confectionery is largely adulterated, for it is only necessary to go to the large wholesalers and ask their prices, which they will quote for both the pure and impure article. The quantity of terra-alba eaten in confectionery is terrific.—*Jour. of Ap. Chem.*

*Amputation Extraordinary.*—A French lecturer on surgery once concluded his discourse on amputations by remarking that the connexions of the head to the trunk are so numerous and so important that the amputation of that member could hardly be undertaken with any reasonable prospect of success. The snb-joined paragraph, which we clip from the Cincinnati *Enquirer*, would seem, however, to show that he was entirely in error :—

“The following extraordinary narrative comes to Chili from San Juan, Argentine Republic: There existed in San Juan an individual eighteen years of age, who had two heads, both of them provided with a countenance at once expressive and of regular outline, each looking toward the sides of the owner, and being united by the posterior part of the cranium. One of the scientific European commissioners, at present traveling through

the Argentine Republic proposed to operate upon the individual, taking away one of the heads. The proposal was accepted, and the operation successfully performed on the 13th ult., without causing the least pain to the patient notwithstanding that chloroform was not administered and the operation lasted six minutes. The operation, and the subsequent cure of the parts, is presented as being something marvelous. The head has been preserved in spirits, and will shortly be exhibited in this country."

South America appears to be the surgical Eldorado. It will be remembered that from thence emanated the story of "union by the first intention" effected by a new process between the body of the decapitated convict and the head of his companion in misfortune.—*Medical Gazette*.

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*Uses of Carbolic Acid.*—I have used carbolic acid in several different cases with much success, and therefore desire to call attention to it.

My first case was one of the sore mouth peculiar to nursing women. When first seen it was of long standing. There appeared to be no sound flesh in the mouth, and large pieces were daily sloughing out. I at once commenced the application of the acid, and in two days the sloughing ceased, and the fetid breath was much diminished. In two weeks the mouth was well. Once during the treatment, the acid was left off, and other washes used for twenty four hours, when the patient began to suffer much from dryness, heat, and pain in the mouth. The acid was again used and relief was almost immediate.—*Med. News*.

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*Richardson's Painless Knife.*—At the meeting of the British Medical Association, "Dr. B. W. Richardson read a 'Note on a new method of Painless Cutting in Surgery.' The author placed before the section a knife consisting of a revolving blade, and which divided with such rapidity that superficial incisions could be made with it without pain. The revolutions were about twenty-five per second, but the speed might be increased. The knife in its action illustrated that an appreciable interval of time is necessary for fixing an impression on the mind, and for

the developement of consciousness. He hoped he would soon be able to give to the surgeon a small pocket instrument with which to open abscesses, and perform many minor operations painlessly, without having recourse to either general or local anæsthesia."—*Medical Gazette*.

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*To Remove Foreign Bodies from the Ear.*—The least painful and most effective means is to envelop the extremity of a probe with adhesive plaster, and, after warming it, apply it directly to the foreign body, allowing it to remain in contact until cooled, when it may be withdrawn easily and painlessly.—*Oregon Medical & Surgical Reporter*.

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*Oxalic Acid for the Sting of a Bee.*—J. Weaver of Kingstown, Ind., from personal observation, recommends a topical application of a strong solution of oxalic acid to relieve the pain and discuss the inflammation produced by the sting of a bee. He mentions several cases where his topic has given almost instant relief.—*Journal Materia Medica*.

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## EDITORIAL DEPARTMENT.

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*Words of Cheer.*—To give universal satisfaction, especially when laboring for the public good at a sacrifice of both time and means, has again and again been attempted, but only to end in failure, so diverse are the motives and opinions of the human race. It is satisfactory, however, to know that services, when they really possess merit, will always be appreciated by those whose opinions are of value, and who are above the jealousy and envy to which human nature is so prone.

To edit a professional journal is by no means an easy task, although it evidently appears so to some, who profess to know all concerning it without having had any experience whatever in the business. At one time we have suggestions as to how a dental periodical should be conducted so as to become popular, and at another time *hear* complaints that the work is not practical enough—in other words that it should have its pages filled with new methods for performing dental operations at a saving of both time, labor and expense, and pay no attention whatever to the collateral sciences, which, although they may improve the mind and increase the general knowledge so necessary in the practice of our profession, do not teach how the greatest amount of money may be obtained at the smallest expenditure of labor,

time and means. It is encouraging, however, to know that such complaints arise only from those whose education has been so sadly neglected that they cannot now appreciate anything above their own standard, or whose nature is so warped by the rank growth of envy and jealousy, that the finer qualities are suppressed.

But when those who are competent to judge express favorable opinions and appreciate efforts exerted for the good of the profession, no heed need be paid to the class alluded to above, who may, perhaps, be more the objects of pity than of condemnation.

We have only space to refer at this time to a few of the many favorable opinions expressed concerning the *American Journal of Dental Science*. Our able and ever welcome confrere, *The Missouri Dental Journal*, at the close of a review of the contents of the February No. of this Journal, says: "It affords us great pleasure to be able to state that we consider *The American Journal of Dental Science* as one of the very best among our list of exchanges."

*The Boston Gynecological Journal*, edited by Drs. Storer, Lewis and Bixby, so well known in the medical profession, says that the *American Journal of Dental Science*, "is edited with judgment and care, and deserves undoubtedly a generous support."

These are "words of cheer" coming from those whose opinions we value.

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*Harris' Principles and Practice of Dental Surgery*.—This work is now being revised by Drs. Austen, Latimer and Gorgas, of the Baltimore College of Dental Surgery, and it is expected that the new edition will be issued by the Publishers, Lindsay and Blakiston, of Philadelphia, early in the coming fall.

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*Review of Prof. Noels Article on Dentine*.—Prof. Judd in the April No. of the *Missouri Dental Journal*, reviews this article, which appeared in the Feb. No. of the *American Journal of Dental Science*, as follows: "Commencing at the completion of the sacular stage of development, Prof. Noel describes the secondary histogenetic process very clearly, but differs, in some particulars, from the doctrines laid down by Tomes and Kölliker, following, for the most part, the peculiar language and description of Beale. Although describing the histogenetic process somewhat differently from the latter author, he arrives at the same conclusions so far as the most important points are concerned. The first point of divergence from the commonly accepted doctrine is found in the statement that masses of germinal matter are found upon the external surface of the pulp, i. e., external to, and resting upon the tunica propria, which extend themselves toward the masses that proceed from the tunica reflexa; that

these meet, and that the one forms the enamel organ and the the other the dentinal organ, which, when calcified, form enamel and dentine. That a dentinal organ is formed external to the tunica propria will be new to many who have been accustomed to regard the process of dentinification as being carried on through the action of the cellular element which forms the periphery of the papilla or pulp proper.

According to the theory here put forth, the essential difference between enamel and dentine consists in the degree to which conversion of germinal matter to formed material has taken place, that while all of the germinal matter has been converted into formed material in the enamel, the central portion of the tubuli, or as he calls them, fibrillæ, still remains germinal matter.

Conclusion ninth to which he arrives reads—Fresh dentine, therefore, has no tubuli, but has uncalcified fibrillæ solid, or nearly solid.

We must confess that we do not exactly understand why a set of hollow rods should be converted into fibrillæ, and declared not to be tubuli, because they are filled with a fluid or soft solid matter. Fill a hard tube with water, or with any other substance that does not blend with it and make a part of the solid substance itself, and it will not change the tube into a fibre, or in any way destroy its identity.

The twelfth conclusion, which expresses the opinions of Beale, is not in accordance with views generally held upon the subject. "Enamel and dentine are not vitalized tissues so far as the calcified portions are concerned. "Enamel is dead—perfectly dead, &c.," does not exactly agree with the opinions one could naturally form from a careful consideration of a few points which are laid down by the author himself. When speaking of the enamel organ, he remarks, "this is the enamel's organic base." Now, if we understand by "organic base" vitalized tissue, would we expect that this vitalized base would be *perfectly dead* as soon as some phosphate of lime and a few other salts were deposited among its elements, and is it moreover probable that this base of connective tissue, if it were dead, would remain unchanging and unchanged during a long term of years, forming not only an exception to the general law which dominates over all other soft tissues, but also militating against that high law which ordains that constant change is stamped upon every atom of matter throughout the universe?

If we were asked to furnish evidence that enamel was not dead—perfectly dead—we would point to the fact, that it is many times exceedingly sensitive to the touch, and that sensibility is one of the most certain signs of vitality wherever it exists. Can any one give as good a reason for supposing it to be dead?"

T H E  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.      THIRD SERIES--JULY, 1870.      No. 3.

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ARTICLE I.

*Notes on Chloroform.\**

By M. J. DEROSSET, M. D.

Professor of Chemistry, Baltimore College of Dental Surgery.

It is a matter of regret that so little is known, while so much is surmised, concerning the method by which the peculiar physiological phenomena of this agent are produced; and yet, if we bear out of consideration the obvious chemical and mechanical actions of a certain limited number of substances, the same remark is applicable to almost every member of the *materia medica*, quoad their relation to physiological processes.

Nevertheless the instantaneous manifest, and marvelous changes which accompany the inhalation of  $\text{CHCl}_3$ , no less than the ineffable benefits and it may be deplorable dangers, which ensue therefrom, seem to call for a more special investigation.

Hypothesis has done more than its share in this respect, while experimentation has been too much neglected.

Abstract reasoning upon this subject, analogical or other can not be relied upon to furnish data which experience may

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\*Abstract of a paper read before the Baltimore Pathological Society, on May 6th 1870.



not refute—while there is nowhere presented a better opportunity for the discovery of truth than is offered by patient and skillful experiment with this agent.

Some things are, however, known to us as facts, and others wear so markedly the facies of facts that we are compelled to accept them as such, and these I propose to present to this Society in the form of *Theses*.

1st. Local anaesthesia from chloroform is limited to those nerves and proportions thereof with which the agent comes into direct contact; but if the trunk of a nerve is brought under its influence the anaesthesia will be more wide spread towards the peripheral end.

2d. General anaesthesia is produced only by direct contact of the agent with the ganglionic centres in which it effects chemical or mechanical changes of structure.

3d. It is conveyed to the nerve centres through the medium of the vascular system—and produces no chemical change on the liquor sanguinis or the discs.

4th. The operation is first exhibited upon the cerebral hemispheres, as is evinced by the impairment of the intellectual faculties, (reason, judgement memory) and upon the cerebellum, as is shown by the absence of co-ordination, and finally upon the centres of excitability (motor).

4th. The nature of this operation is unknown, but it may have several factors—diminished histogenesis and histolysis, solution of fatty nerve elements and of protogon, resulting in alteration or suspension of function.

6th. Sudden deaths in surgical practice have not become more frequent since the introduction of chloroform.

7th. Death by asphyxia, with its usual phenomena, is extremely rare; but it may happen if by a too rapid administration, atmospheric air is excluded; it may also happen from paralysis of hypoglossal and motor filaments of glossopharyngeal (permitting the tongue to fall back and obstruct the glottis), and of inferior branch of vagus (relaxing the vocal cords).

But death from asphyxia proper rarely and perhaps never occurs from any cause except the exclusion of air.

8th. Chloroform death, in almost every case, proceeds from syncope, the heart being paralysed.

Local anæsthesia of the periphery of the sensitive filaments of the vagus and sympathetic nerves in the lungs and heart would prevent the reception of impressions for conveyance to the ganglionic centres; hence there would be no reflex-motor action to the heart and lungs, and the death would be from an eccentric cause. Or the ganglia from which the vagus derives its motor filaments (hypoglossal, facial and spinal accessory) may be overpowered by immediate contact with the agent causing the arrest of the heart's movements—the cause in this instance being centric.

9th. The too rapid administration may supersaturate the blood. Chloroform is very slightly soluble in water or blood—a slow cautious inhalation may introduce no more than can be readily taken off into the circulation in a state of solution—but if rapidly introduced there may happen a collection of gaseous chloroform undissolved, (and perhaps even separated in a liquid form), producing a spumous, frothy state of the blood, from which death would ensue with symptoms similar to those which follow the introduction of air into the vessels. And indeed the phenomena of death from chloroform simulate, generally in every essential particular, those which are described as the consequence of this accident.

The cause of death from the introduction of air is as yet not determined, but it is easy to understand how frothy bloody or heavy liquid chloroform passing through the minute vessels of the medulla or other portion of the cerebro-spinal axis would determine the immediate abrogation of its functions.

In presenting these theses and the hypothesis which forms the last one, it is proper to state that they have not been deduced from a consideration of the superficial analogies which  $\text{CHCl}_3$  may bear to other anæsthetic agents, for in-

deed less is known of these probably than of it, and analogical methods of reasoning yield generally fallacies unless they start from fixed data. It is manifest however that the less or greater number of chlorine equivalents in a given substance can not be regarded as determining its anæsthetizing power since a great many are found possessed of the same property, which contain no atom of this element, conspicuously,  $\text{N}_2 \text{O}$ ;  $\text{C}_4 \text{H}_{10} \text{O}$ ;  $\text{C}_5 \text{H}_{11} \text{NO}_2$  this latter being the most promising agent yet discovered.

In insisting upon the extreme variety of chloroform death by primary asphyxia, I am not unmindful of the striking experiments conducted by a celebrated veterinary surgeon in France and published in 1867, in the *Archives Generales*, but, the phenomena usually attending the death of a human being while inhaling chloroform are so entirely different from those exhibited in cases of death by apnoea from other causes, that the conclusion is inevitable.

It should always be administered slowly and gradually, which is contrary to the opinion urged by some authorities, but which I consider sufficiently established by the facts.

The amount of chloroform in the inspired air should not exceed 1 or 2 per cent. or less than one half cu. inch of gaseous chloroform; it diffuses less rapidly than air, in the ratio of about 1 to 18. An elevated temperature determines, *ceteris paribus*, its more rapid conversion into vapor as does a low state of the barometer.

The best inhaler is a cambric handkerchief folded twice, upon which ten or twenty minims may be poured after every ten or twelve inspirations. Chisolm's inhaler is the most valuable of all the apparatus especially designed for the purpose—and it has the advantage of economy over the simple method. All other inhalers for chloroform are worse than useless.

In cases of threatened death, artificial respiration should be instantly resorted to with a view of moving the current of blood through the lungs—it should be thoroughly performed, about 30 times a minute—the directions, hitherto

observed, to imitate the natural movements being faulty in principle, and not adequate to supply the demands of an embarrassed circulation.

The larynx and trachea should be kept open by whatever necessary means, even to the extent of incision into the latter, and Dr. Richardson's bellows may be tried, or the ordinary hand bellows.

The advantage of a postural treatment, on the left side, as adopted at the London ophthalmic hospital, is not borne out by any scientific considerations and experience has as yet been too limited to justify its adoption in inconvenient cases to the exclusion of more promising methods.

The application of a mild interrupted current of electricity to the phrenic sympathetic vagus nerve should never be neglected. The current should pass from the cardiac and epigastric regions towards the superior portion of spinal cord and medulla oblongata, the positive electrode being placed anteriorly and the negative one on the nape of the neck.

Singular and indiscriminate application of electricity is pernicious.

The object of electricity is to supply artificially the stimulus which the *besoin de respirer* normally gives to the lungs, and the excito-motor action which the passage of blood through the the heart produces. The reflex movement thus induced through the motor fibres of vagus and phrenic determines the movement of these organs. Furthermore, the artificial galvanisation of the sympathetic in the neck determines a more powerful contraction of the peripheral vessels of the brain and other parts, pouring onwards their contents, whether these be blood, frothy blood or liquified chloroform, as assumed in the 9th thesis.

In desperate cases the injection into the veins of diluted ammonia water may be tried to arouse the sinking nerve force, and to contribute towards the preservation of the fluidity of the blood.

A similar use of a solution strychnia, may be tried, in as much as this alkaloid given hypodermically in cases of im-

pending death from chloral has promptly alleviated the symptoms, moreover chloroform is our readiest means for overcoming the tetanic symptoms of strychnia.

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## ARTICLE II.

### *Prophylaxis or Prevention of Dental Decay.*

By Professor Andrew F. M'Lain, D. D. S., M. D.,

Read before the Southern Dental Association

From the great amount of industry, zeal, and intelligence which have been, and are still being directed through journalistic and other sources, by gentlemen of attainments and skill, on the various branches of the *healing art*, to the treatment and cure of diseases pertaining to their respective specialties, it appears somewhat singular, that with the varying, nay, sometimes doubtful success which attends and has always attended such efforts, and from the prevalency and constant recurrence of those same diseases, so little attention has been paid to *prophylaxis*, or what is more familiarly known as *prevention*.

If this observation is true of the medical art proper, how much more applicable is it to dental surgery than to any other of the allied branches of medicine, inasmuch as the causes of dental decay being rather of a physico vital character, they are better understood, and are, therefore, more easily guarded against.

As prolific as dental literature has become, and numerous and able, taken as a class, as are the practitioners of this beneficent art, very few among them, indeed, have thought of applying that homely old adage, that "an ounce of prevention is worth a pound of cure," but it would seem that the *sine qua non* of their aim and ambition consisted in combating diseases already established, instead of warding them off.

Admitting that dentists, as well as physicians, are not usually consulted until the patient has become ill, or is seriously threatened with illness, or the ravages of caries have

already begun in the dental organs, still much good might be done, in default of that elementary knowledge which should be possessed, at least, by all heads of families, if not generally, how to preserve the teeth from those disorders to which they are so commonly subject, by dental practitioners adopting the plan of imparting to their patients during their professional intercourse with them, or to the parents or guardians, when these are too immature in age to profit by such instructions, some practical information concerning the nature and chemical composition of the teeth; the general causes of their decay; how they may be acted upon by certain agents taken in the mouth as food or drink; the necessity of certain kinds of food being used in order that the integrity of their organic structure may be maintained; by explaining to them the relation which the teeth bear to other portions of the organism, and how by reactions from other organs (the stomach for instance) the teeth may become affected; by giving them an idea of the office of the teeth and at the same time setting forth how much the quality of the blood, and consequently, the proper nutrition of those organs depends upon the perfect mastication of the food; and above all, they should be fully impressed with the necessity of absolute cleanliness of the teeth, together with the observance of such other hygienic and preventive measures as may be deemed appropriate to the case.

The French, as a general thing, are much better versed in those rules having reference to diet and ordinary hygiene than the American people, for children are taught at an early age, to exercise some discrimination in the choice of food, by selecting such articles as are healthful and nutritious, and to eschew those that are naturally indigestible, or whose qualities are impaired, or whose effects are otherwise pernicious. And what is of great moment, they are made to observe some regularity in the periods for taking their food, besides restricting the quantity thus taken within the proper bounds, while, at the same time, avoiding it at improper hours. They are likewise indoctrinated as soon as sufficient

intelligence is manifested, with some general ideas of sanitary laws, which, however crude they may be, often prove of infinite benefit to them, and to those who, perchance, may come under their guidance.

Though such teachings may not possess more than the faintest glimmering of science, yet by their practical utility, children are insensibly led to understand how to avoid all unnecessary exposures and those grosser modes of life so inimical to health. I would not be understood as implying that the dentist should become the *mentor* of his patients, and thus usurp the sphere of the natural guardians, but he may whilst engaged in the legitimate performance of his professional duties, do much toward correcting popular errors and pernicious habits that are no doubt destroying millions of teeth annually.

The hygienic management of the teeth needs no formal introduction, for not unfrequently the subject is brought up by patients themselves, who manifest their solicitude by asking, "Doctor how can I prevent my teeth from decaying?" At other times, the perceptible neglect, or the evident abuse of the dental organs, will suggest to the operator the propriety of advising, after, however, ascertaining from the patient something of his or her habits; in short has discovered in what the error consists, some rational course of conduct, by which, if the evil can not be remedied, at least, that no further mischief may ensue. If neglect of cleanliness has given rise to the trouble, it becomes the dentist's duty, to explain, that the teeth being of an alkaline nature, the accumulation of food about them, especially of vegetable matters, a fermentative process, accelerated, no doubt, by the warmth and moisture of the mouth, is established, and which results in an acid product, capable of acting on the enamel of the teeth, but more energetically on the bony structure; thereby causing that decomposition called dental decay. On the other hand, should the well being of the teeth be jeopardized by their abuse, whether from hard usage or from the habitual use of acid ingesta or drinks, such habits should

be unequally condemned, by showing how the biting of hard substances is liable to crack or fracture the enamel and thus expose the dentine to the operation of external agents; and that the frequent contact of acids, having as they do, a natural chemical affinity for the alkaline earths of the teeth, induces a disintegration which eventually terminates in the usual phenomena following upon dental caries.

It should likewise be shown, that the physical or constitutional integrity of the teeth depends very materially upon the healthy functions of the stomach, for the habitually faulty performance of the digestive process causes the dissolution of the teeth through acid reactions, as well as inducing, as has already been intimated, a deterioration in their organic structure from not receiving sufficient nutriment from a circulating medium, rendered through dyspeptic tendencies too poor in amount and quality of its nutrient elements.

In regard to the influence which diet exerts on the textures, it should be pointed out to patients, that certain kinds of food produce certain effects on the structures, hence, the great necessity for a judicious choice in the articles to be used. Although it is generally admitted that man thrives best on a mixed diet that is composed of animal and vegetable substances, yet it is equally certain, that a due proportion of certain principles should exist in that food whether mixed or not, in order that each part of the organism may derive the elements of which it is composed. Hence, the different tissues require different kinds of nourishment, inasmuch as waste is going on continually, each organ, therefore, deteriorating if not constantly supplied with pabulum suited to its nature. Some textures demand albumen for their sustenance, some saccharine or amylaceous properties, others oleaginous or phosphoric or sulphurous, while again, others derive nourishment from lime in different forms, magnesia, silica, etc., all entering into various combinations to suit the requirement of individual organs and of the whole assemblage of organs, and each having the power to select the food possessing the properties peculiar to its organization. The



phosphate of lime with a trace of the flouride or silicate of calcium together with the carbonate of lime and magnesia, enter largely into the composition of bones, but still more abundantly in that of the teeth. Now, it is perfectly evident that in consequence of the intermolecular waste or deterioration already noticed as being constantly in operation, the various portions of the organism can be maintained in their normal standard, only by being well supplied with those materials so essential to their constitutional nature, a condition naturally and very readily effected if such matters be present, or allowed to remain in the food.

The various species of grain such as wheat, rye, corn and many others, possess naturally those earthy or calcareous principles alluded to in sufficient quantity for the demands of the economy, but *man*, from a vain desire to improve on nature, has foolishly devised, through the process known as "bolting," the means of divesting the grain of the greater portion of its calcareous substances which always exist on its exterior, thus depriving the bread that is commonly eaten of its most essential properties.

It has been frequently observed, that the Scotch, English, German and French peasantry, and all those nations whose diet consists of the plainest kind of fare, a large proportion of which being coarse brown bread, are endowed as a general rule, with a much better quality of dental structures than those of the more luxurious classes of society.

Unfortunately until the majority of the people in this age of refinement and false living are educated to a better standard with regard to culinary knowledge, it can not be expected that they will go back to primitive or natural habits and customs in the preparation of their food, especiall, here in the United States, where the most unscientific, I might say, execrable cookery is done, but dentists being conscious of a gradually increasing defect in the structural condition of the teeth of the younger generations, whether produced by the removal of the necessary earthy elements of their composition from the food, or from their original absence or defic-

iciency in such aliment, might, whenever the demand for them seems to exist, recommend their regular medicinal administration, as a compound part of each meal, in such quantity and form as the case may require.

Of course, in adults, where the teeth are naturally deficient in the earthy constituents, such organs will be less amenable to remedial measures, and are, therefore, incapable of any marked constitutional improvement, but I have long held it quite possible, that by the early administration, (commencing in *u'tero*) of the phosphate preparations of lime, to be able not only to avert this condition of the teeth, but to impart a good structural quality to every living offspring.

It, therefore, follows, if this hypothesis be true, that the most favorable time for the accomplishment of this object, would be to begin with the mother during gestation, previous to the formative stage of the teeth in the child, and continue until the second dentition shall have been completed, a period in life when the absorption and appropriation of all the constituents that go to make up the body are well known to be most active. There are cases too, later in life, when their exhibition would not be unappropriate, but it will be readily apprehended, that in them, it would be more for the purpose of maintaining the teeth at a given standard in quality.

Now, as regards the more eligible *forms* in which the lime salts should be given, I am disposed to accord the preference to the hypo-phosphate or the lacto-phosphate as being more easily assimilated. At all events, this hypothesis received considerable support from a series of experiments recently instituted by Messrs. Dusart and Blanke, of Paris, with the lacto phosphate on guinea pigs. These experiments consisted in taking a number of these animals of the same age and size, and feeding them all alike, but giving to one half of them, which had been separated from the others, a certain quantity of the lacto-phosphate of lime in addition to the usual daily food. To mark still more closely the

physiological effects of the drug in health and disease, some of each class had a limb broken, Some length of time was allowed to elapse, and then all the pigs were killed and their bones respectively weighed and noted. It was found after repeated trials, that the bones of those to which the lime had been given averaged thirty three per cent more in weight than the bones of those from which the lime had been withheld.

It may be objected, that in view of the natural differences existing between the higher and the lower animals some differences in its physiological effects on the human species might obtain, but the effects of medicine, generally, on the two orders when they do occur, are usually so nearly similar, and are so slight as to be merely nominal.

In conclusion, gentlemen, I will reaffirm, that imparting to patients the various sanitary rules respecting the hygienic management of the teeth, is a duty which dental advisers owe to them as well as to themselves. There need be no fear, as some have expressed, that the vocation of the dentist would be destroyed by thus instructing the people—that there would be no more decay of these organs, but it should be remembered, that so long as the artificial state into which mankind has been drawn continues, and as long as accidents and the various other ills to which flesh is heir obtain, just so long will the teeth be liable to disorders, and, therefore, require dental aid.

Practitioners of the art of Dental surgery whose professional education is so defective as to render them incapable of giving suitable advice for the proper management of the teeth, should retire at once from the field of practice, and leave it to those who are able to advise as well as to execute. I trust, however, that the day is not far distant, when every member within the fold of the profession, will not only be competent to inform patients how to preserve their teeth, but also to convey the knowledge how to impart good Dental organs to unborn generations.

ARTICLE III.

*Southern Dental Association.*

Nashville, Tenn., May 10th 1870.

To the Editor of the *American Journal of Dental Science* :

DEAR SIR:—Having just returned from New Orleans, where I have been attending a meeting of the Southern Dental Association, I propose a few lines for your Journal.

The meeting commenced on Wednesday morning, April the 15th, and continued until Saturday afternoon, making about four days. During this time we had a good deal of discussion, a majority present entering into it with that sort of generous and liberal spirit that always brings about a harmonious and pleasant state of affairs.

Notwithstanding this was the first regular meeting after organizing, it was a very good one, in fact a perfect success. It is true a few of the Southern States were not represented, which we hope will not be the case again ; but while that was so. I am glad to say we had a good many Northern brethren with us, whom we were very glad to see. In future we hope to see many more, all are invited. The word Southern does not mean sectional, it just simply means a name for the Association. I am sure all present, and especially those from a distance were not only interested and pleased with the meeting, but delighted with the reception and treatment of the New Orleans Dentists. If ought should be said of them, it should be of their generous, liberal expenditure of means during our stay with them. The next meeting will be held in Charleston, S. C., commencing on the second Tuesday in April, 1871, at which time and place we hope to see not only every Southern State well represented, but a goodly number of the Northern. Having promised at the last meeting of the American Dental Association, to do all in my power to interest the profession South in the next meeting, which will be held in this place (Nashville, Tenn.) commencing on Tuesday Aug. the 2d.

I will say so far, I have left nothing undone, that I have been able to do, and will continue my efforts up to the day of the meeting.

From encouragement received from various parties South with whom I have been corresponding since my return from Saratoga last summer, and at New Orleans during the meeting of the Southern Association, I have reason to believe the South will be pretty well represented, and from what I know and hear of the North, I am of the opinion that the next meeting will be the largest we have ever had. As one of the committee of arrangements, I will say we are about ready for the meeting, having done the most of our work up to this time. We have managed to obtain a most excellent hall for the occasion. At a request, our Legislature passed a resolution granting us the privilege of using one of their halls. We have also seen the proprietors of the principal hotels in the city, and they have agreed to make liberal deductions to delegates who may stop with them. I have not heard from the transportation committee, but I have no doubt they will be able to get parties to and from Nashville for half price. It was done by our Southern Dental Association at New Orleans, without any trouble.

Yours Respectfully, S. J. COBB.

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#### ARTICLE IV.

#### *Wasted Alveolar Processes and Gums.*

By W. H. Atkinson, D.D.S., M.D.

Read before the Southern Dental Association, April 14th, 1870.

To ask for remarks upon this particular subject requires more of him who is to answer, than enters into the minds of most that ask it; for it involves more minute knowledge of anatomy and physiology than those claiming to be the best pathologists extant have yet attained. The claim of knowing, opens to him who makes it a multitude of responsibilities, legitimate and illegitimate, perceived and unperceived, of which he will be made aware so soon as he attempts to reply to the satisfaction of all who endeavor to perplex and

annoy him, that they may show how sharp they are in propounding deep queries. The greatest difficulty in the way of clear elucidation and explanation to Dentists as a class, is their utter lack of knowledge in histology. Coming from the shop rather than from the college into the practice of Dentistry, is the principal cause of this lack. And even those who have availed themselves of all the colleges have taught, are yet in the verriest alphabet of histological science.

We speak of healthy and unhealthy systems and organs, and assume to be able to deduce their status from inspection of the exteriors, utterly forgetting, or ignoring that the elements of organs and systems must have departed very far from the healthy standard before it be possible to determine that fact by observation. In fact we must become familiar with the character of bodies too small to be seen by the unaided natural sight, before we can by possibility comprehend in any clear manner the subject of function.

Our first duty is to determine the conditions of the case when presented for our advice and treatment. Let us take a case of "wasted alveolar process" as it presents. How shall we proceed? Why, look at and examine it, of course every one says at once, yes that is very well so far as it goes, but the important query is, how far does it go? and what is the process of looking at and examining? I will not pretend to designate the process that, as a rule, passes for examination; but that it is too frequently a hasty, careless glance at the parts, and as hasty a decision, that it is probably an hereditary condition or taint that nothing now can prevent or remedy, is of too frequent occurrence to permit us to doubt it.

If this is what has passed and is passing for diagnosis and prognosis in these cases, is it not worth our while to ask what the process ought to be, what it really involves, and how we ought to proceed?

First, then, the process ought to be such as to enable us to definitely determine the exact state of the case; and sec-

ond, it involves a knowledge of the formation, growth and nutrition of the parts concerned; and third, we ought to proceed on this basis of a knowledge of the primates which elaborate the function of the territory involved.

It is evident, to carry out this plan of procedure we must be able to comprehend the ever changing condition of the anatomical elements, by which the pabulum is appropriated, and the non-pabulum is rejected, because the first is needed, and the second is not required at the time. It is precisely this alteration of work and play, or labor and rest of these minute bodies that constitute normal function, accepting that of which they stand in need and rejecting that not required to maintain them in proper size and activity for the use of the system to which they belong, and which they in the aggregate constitute. In the light of this statement, it will be evident to all prepared to take it in, that there are but two primal conditions of interference with the equable performance of the all important work of maintaining these elements of the tissues in health. And these two basic elements of pathological activity are simply *deficiency* and *excess* of the work of normal function. If then, laziness and pulse activity lay at the very threshold of aberrant function in the simplest elemental bodies of our systems, shall we regard it as a wonder that the same or like divergences from normality, find their unwelcome way into the tissues, organs, systems and minds which constitute us individuals, and lay the foundation of all our responsibilities, mental and material, moral and physical?

Let us now inquire, what are the elementary bodies of the alveolar processes? And answer: the alveolar process proper is that which we denominate bone. And, now, what are the elements of bone? And reply: not as the schools and erudite authorities teach, "an animal substance known by a specific form of cell," but as nature and common sense, honestly interpreted and exercised demonstrate, a mixed example of mineral and vegetable elements, produced and maintained in specific degree of differentiation by animal

surroundings—these being first, Pabulum ; second, Nervous ; and third, Vascular in character. These animal bodies themselves partake, in their degree, of the character of vegetable and mineral modes of maintaining existence.

The vessels and nerves that creep in congeries and fasciculus, capillary and filament, over and among the osseous substance of the alveolar processes, come from and return to the general centers of heart and lung, brain and spinal cord, that the afflux and efflux of affete and effete pabulum may maintain the harmonious relations of health among these diversely endowed elemental bodies.

If the processes of the production and nutrition of the teeth and alveolar processes be comprehended, we are prepared to understand that the enamel is maintained in sound condition exactly as crystals are in the mineral domain of material bodies : and that the dentine is kept in condition by the to-and-fro movement of fluid in the passages that admit it, after the manner of the vegetable, and that bone is supplied by a mixed expression of these mineral and vegetable modes of endowment. Cement may be in this sense classified as bone, although it is the compromise of nutrient activity just midway between dentine and bone proper, of which the alveolar process is a legitimate example.

The process is surrounded by a fleshy body called gum, composed of tissues, wrought out of the blood corpuscles, and collagenous fibres, that is well supplied with bloodvessels, but sparingly with nerves, especially, the margins around the necks of the teeth where its connective tissue fibres are wrought into the "*ligamentum dentium*."

We are now ready to assert that there are two forms of "wasting of the alveolar processes," namely, solution of the earthy material, in the membranous or collagenous matrix, the latter remaining entire and in place ; and solution of both matrix and mineral salts. The latter occurs under two forms also, the first by atrophy of the elemental constituents as the margins of the processes," and the former by a loss denominated ulceration or caries of the edges of the process.



Ulceration is resultant upon local expression of systemic debility or local uncleanness. Atrophy results from pauperized blood or mechanical interference. Mechanical disturbances have also two doors of entrance: first accumulations of foreign matters of benign character, and second, injudicious efforts at cleansing the teeth with unsuitable instruments and dentifrices.

The production of the alveolar processes is part and parcel of that known as the process of dentition. And the only reason why the alveolar processes are liable to wasting and reproduction to a degree not known to the two harder of the dental tissues, namely, enamel and dentine, is in consequence of the difference in the mode of growth and nutrition by which they are produced and maintained as already hinted.

In all cases of wasting dependent upon constitutional degeneracy, general treatment combined with local cleanliness will be the remedy.

In such instances as are brought about by excessive and misdirected brushing, the remedy is to correct the manner and amount of effort.

And in cases of ulceration or caries of the alveolar processes, proceed to remove all foreign material, by carefully and scrupulously cleansing and polishing the necks of the teeth and margins of the processes, and then wetting the raw surfaces of process, tooth and gum with a strong solution of the chloride of zinc. After which establish correct hygienic habits, and all is well.

And now for correct hygiene of the mouth and we have done for the present. Oral hygiene, like general hygiene is almost unknown and uncared for, other than for mere "appearance sake," hence little studied and most wretchedly practiced.

Here, as everywhere, the opposite of the truth has been taught and prevails? In one word, then, we ought to *always* brush the denture *in a line with the length of the teeth* (and *never across* it as the *universal custom is*), and *from* the gums toward, and over and *between* the crowns of

the teeth so as to harden the margins of the gums and cause them to close up tightly the line of junction with the necks of the teeth, and thus keep the teeth well polished on all sides. Any amount of use of brush and dentifrice necessary to accomplish this should be strenuously insisted upon, especially in the children and younger patients under our care.

In other words, polish off the "persistent capsule" or "Nasmyth's membrane" as it has been called, so soon as the crowns of the temporary or permanent teeth emerge from the gums, by any means that will secure a fine polish to the distal ends of the enamel rods; then keep up the polish by the use of brush and dentifrice as already stated during life.

To be quite clear, let me once more say: brush the *upper* teeth *downward*, and the *lower* teeth *upward*, scrupulously avoiding any *in* and *out* motion of the brush, as it is this *pernicious practice* that so universally exposes the necks of the teeth on the outer side, in the mouths of all, so called, "good brushers."

So soon as these principles and practices shall prevail there will be no more cases of "wasted processes and gums" to perplex our minds and scourge our affections.

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#### ARTICLE V.

##### *The Fourth Annual Meeting of the Tennessee Dental Association.*

The fourth annual meeting of the Tennessee Dental Association, will be held at Murfreesboro, Tenn., on the July 28th, 1870. The following are the officers:

*President*, S. J. Cobb, Nashville, Tenn.; *First Vice President*, J. C. Ross, Nashville, Tenn.; *Second Vice President*, M. McCarty, Pulaski, Tenn.; *Recording Secretary and Treasurer*, H. M. Acree, Clarksville, Tenn.; *Corresponding Secretary*, C. P. Baird, Nashville, Tenn.

The following Committees were appointed at the last meeting:

*Committee on Diseased Antrum*.—W. H. Morgan, Nashville, Tenn.; W. R. Johnston, Columbia, Tenn.

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*Committee on Diseased Gums.*—S. H. Beard, Murfreesboro, Tenn.; R. R. Freeman, Nashville, Tenn.

*Committee on Indication for, and Extracting Teeth.*—L. C. Chisholm, Nashville, Tenn.; L. Augspath, Helena Ark.

*Committee on Preservation of Children's Teeth.*—E. C. Ford, Sommerville, Tenn.; L. T. Gunn, Nashville, Tenn.

*Committee on Dental Physiology.*—W. T. Arrington, Memphis, Tenn.; A. F. Claywell, Lebanon, Tenn.

*Committee on Voluntary Essays.*—C. P. Baird and L. C. Chisholm, Nashville, Tenn.

*Committee on Filling Teeth.*—J. A. Arrington, Jackson, Tenn.; Alex. Hartman, Murfreesboro, Tenn.; J. T. Cazier, Jonesboro, Tenn.; C. A. Jordan, Huntsville, Ala.

*Committee on Teaching Students.*—C. P. Baird and J. C. Ross, Nashville, Tenn.

*Committee on Dental Pathology.*—M. McCarty, Pulaski, Tenn.; J. B. Wasson, Memphis, Tenn.

*Committee on Dental Neuralgia.*—S. P. Cutler, Holly Springs, Miss.; J. Fouche, Knoxville, Tenn.

*Committee on Contour Fillings, Sponge Gold, and Heavy Foil.*—E. W. Sawyer, Memphis, Tenn.; J. T. Cazier, Jonesboro, Tenn.

*Committee on Mechanical Dentistry.*—E. S. Chisholm, Tuscumbia, Ala.; L. C. Chisholm and R. Russell, Nashville, Tenn.; T. E. Beech, Franklin, Tenn.

## SELECTED ARTICLES.

### ARTICLE VI.

#### *Case of Cleft Palate.*

NOVEL PROCEDURE FOR IMPROVING THE VOICE AFTER THE OPERATION OF STAPHYLORAPHY.

(Under the care of Mr. Francis Mason.)

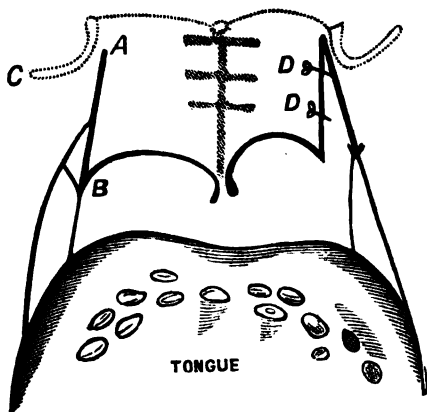
Every surgeon who has any experience of congenital cleft palate will, we believe, admit that the principal object for which the operation is usually undertaken—that is, the improvement of the voice,—is seldom attained. In the most favorable cases, however accurately the edges of the cleft

may be adjusted, and however well satisfied the operator may be with the result of his manipulative skill, the patients and their friends invariably express some, and often a great deal of disappointment that the tone of the voice remains much as it was. A little consideration will suffice to show why the expected improvement does not take place. It should be remembered, that the condition of congenital cleft palate is not that of a mere slit or rent, but is an absolute want of substance in the part; and, in order to make good this deficiency, a "gusset," as it is termed, is required. Now to make a gusset of living material seems difficult, if not impracticable; hence surgeons are contented simply to bring the edges of the cleft together, union being almost infallible if the muscles be divided in accordance with the plan recommended by Sir Wm. Fergusson. The result of the operation is that the two sides are necessarily put considerably on the stretch, and the soft palate, instead of being freely movable and capable of being brought by muscular action upwards and backwards against the posterior wall of the pharynx, remains as a tight curtain, so placed as to allow air to pass into the posterior nares, causing that peculiar nasal twang more or less constantly noticed in this condition. It therefore stands to reason the voice cannot be materially altered or improved under such circumstances.

Mr. Francis Mason has devised, and has recently carried out at the Westminster Hospital, a novel and ingenious proceeding, having for its special object, the improvement of the voice. Mr. Mason deals essentially with the soft palate, and assumes that the cleft has been already closed by a previous operation, and that sufficient time has elapsed so that the circulation between the two sides has become thoroughly established. He has reason to think that by freely dividing the soft palate on both sides, in the manner about to be described, partial, if not complete restoration of the normal voice may be effected. The object he has in view is so to release the soft palate that it may be brought more closely in apposition with the back part of the pharynx, and thus to a certain extent if not wholly, do away with the disagreeable nasal

twang already alluded to. The subjoined diagrammatic wood-cut, representing the isthmus of the fauces, seen from the front will serve to illustrate the steps of this operation. The dotted lines indicate the edge of the hard palate and the hamular process on each side. The cicatrices of the suture. in the middle line of the soft palate, the result of the previous operation, are also shown.

The patient is placed in the recumbent posture, and may or may not take chloroform. The soft palate is completely trans-fixed with a sharp pointed knife at A, at the inner edge of the hamular process (c), the outline of which may, in most cases, be distinctly seen in the living subject. The incision is carried downwards from A to B, dividing the whole of the soft palate. A similar incision is made on the opposite side, and the operation is completed by introducing with a needle in a handle, one or more sutures from before backwards at D, hemming (so to speak) the anterior and posterior mucous edges, thus preventing the newly-made raw surfaces from uniting by granulation. In this proceeding the palato-glossus, palato-pharyngeus, and the tensor palati muscles are purposely divided. The levator palati is not interfered with, or at most only a few of its fibres are cut.



The case upon which Mr. Mason operated is that of the

boy, now aged six, whose palate he closed without chloroform in October last (see the *Lancet*, Jan. 9th, 1869). The result is so far satisfactory that there is a decided improvement in the boy's voice. As this is the first patient upon whom this operation has been performed, it would be premature to form a strong opinion as to the probable results; meanwhile the operation seems to commend itself as being extremely simple, free from danger to important vessels, and not particularly painful—a lump of ice in the mouth for a minute or so would render it almost painless. Moreover, chloroform may be administered (as in this case), vomiting, if it occur, being no disadvantage. There is an ample supply of blood to this part so that sloughing need not be apprehended; and further it is, a proceeding that may be undertaken at any period of life, and repeated as often as necessary, in case the cut surfaces should unite by granulation. Mr. Mason contends that it can do no harm; and if, on the other hand, it be attended with even partial success, it supercedes any mechanical appliance, and confers an inestimable boon on patients whose condition is distressing both to themselves and to those with whom they associate.—*Lancet*.

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#### ARTICLE VII.

##### *Chloroform—Pro and Con.*

By PROFESSOR N. R. SMITH.

Is the question yet settled whether the introduction of anæsthetic agents in surgical practice is, after all, a blessing to mankind, and a safe and useful adjuvant to surgery? I am aware that many will regard the mere suggestion of this question as heretical; but surely the disastrous results from the employment of the powerful agent, chloroform, have been recorded in a sufficient number of instances to justify the query.

The question which I discuss is not whether chloroform may not be so employed as to be a useful agent; but whether, employed as it is and has been, it has been productive of more good than evil.

When we subject to a painful operation a patient whose constitution, and the state of whose nervous system, are favorable to the salutary effects of chloroform, and when, on the administration of that agent, we see what would otherwise be a painful operation accomplished without the infliction of the least suffering, the operator himself exults in the possession of such an agent, and the unprofessional bystanders are filled with astonishment and admiration.

To such an extent have the happy effects of chloroform been extolled by the profession, that it is not surprising that the public generally should be inspired with unqualified confidence in the agent. This confidence is the more readily accepted because the mind is so willing to adopt that which promises so much. When the transfusion of blood was introduced and practiced in Europe, with the promise of restoring youth to age, the public mind was wonderfully excited. Hundreds offered themselves as the subjects of the experiment, and many deaths resulted from the practice. The governments of Europe were obliged to interfere and forbid the practice.

Now I wish it to be understood, *in limine*, that I employ chloroform in surgical practice, and shall continue to employ it. I merely wish to point out many of the evils resulting from its use, with the hope that those evils may be, in a degree, avoided.

Not the the smallest of the evils arising from the use of chloroform results from the overweening confidence of the public in its efficacy and its safety. They are, therefore, unwilling to submit to the most trifling operation without being placed under its influence, when, perhaps, the administration of the anæsthetic is a far more perilous matter than the operation itself.

The profession are well aware that the deaths from the use of chloroform, even in the hands of scientific men, amount to hundreds, and, if all the cases were truthfully reported, probably to thousands. Men have died from its influence who have, on former occasions, breathed it with

impunity; many have perished from it who labored under no organic or functional disease which would seem to forbid its use.

But it is not alone by the sudden extinction of life that chloroform is productive of bad results. The secondary effects of it must by no means be overlooked. It is a grave question, which, perhaps can not yet be satisfactorily answered, does chloroform contribute to the successful issue of surgical operations? The great object of the surgeon is to cure his patient. If he can accomplish this without the infliction of pain, so much the better; but the great end is to *cure his patient*, pain or no pain. If the use of an anæsthetic diminish the probability of his recovery, it is undoubtedly to be rejected.

Are surgical operations as happy in their results as they were before chloroform was introduced? Since anæsthetics were introduced, which is some twenty-five years, if I mistake not, I have constantly employed them in very extensive surgical practice, and, although I have not kept such accurate records of my cases as would enable me to make out statistical tables, I think I can conclusively compare the results of operations under chloroform with those performed without it. I therefore confidently say, that the disastrous sequelæ of such operations have been more common when chloroform has been employed. The first disastrous result to which I allude is secondary hemorrhage.

It is well known that both chloroform and the ethers subdue the force of the circulation, especially in the smaller arteries. Reaction does not fully come on in many instances for hours. After an amputation, or the extirpation of a tumor, the larger arteries bleed, and we secure them. We wait a reasonable time for reaction. The pulse, perhaps, indicates that it has resulted, and, anxious to place our patient in a condition of comfort, we, after again carefully searching for bleeding vessels, close the wound and apply our dressings. After the lapse of four or six hours we are summoned to our patient on account of bleeding. When



we arrive we find that there has resulted a reactive excitement in the heart and arteries. The patient has lost a considerable amount of blood, and, what is not less mischievous, the wound is distended with coagulum, and great irritation caused thereby. Indeed the painful distension is one cause of the continuance of the hemorrhage.

To arrest the hemorrhage we are now obliged to open the wound, turn out the coagulated blood, and secure the arteries. This is an operation not less painful than the primary one, and, on account of the condition of the patient, more productive of irritation. But the loss of blood thus incurred, and the irritation and renewed shock, are not the only evils resulting. Notwithstanding our efforts to cleanse the wound of blood, much will remain adherent, and will have penetrated the tissues. The exposure of the wound to air favors the putrefactive process in the blood retained, and, when suppuration results, the sanies produced enters the circulation, and ichorrhæmia is the consequence. Whether we term this pyæmia or ichorrhæmia, it can not be doubted that it far more frequently results where secondary hemorrhage occurs and the wound becomes stuffed with blood. The impairment of the vital powers, caused by the loss of blood, contributes to the same result.

I appeal to all surgeons whose observations have extended over the period of half a century passed, as mine have done, to say whether pyæmia has not been far more common as the fatal issue of surgical operations, than it was before chloroform was introduced? Has not this form of disease occupied far more of the attention of surgeons than it formerly did? Does not this frequent sequel of surgical operations at this time fill the minds of surgeons with dread? Does not the fact that far more has been written about pyæmia, since chloroform was introduced than ever before, give evidence of its more frequent and fatal occurrence?

There are other modes in which the use of powerful

anæsthetics promote this pyæmic condition. The agent powerful enough to make such an impression upon the system as to make it insensible to the pain of a formidable operation, must very powerfully influence the functions of the nervous system, and morbidly modify them. The constitution of the blood must also be more or less modified.

But there are cases in which surgical manipulations are practiced in which incisions and the loss of blood are not involved—as, for instance, those employed in the treatment of dislocations and of strangulated hernia.

In the reduction of the hip and shoulder a double advantage is obtained by the use of chloroform. We not only obviate pain, but we overcome the rigidity and resistance of muscles which otherwise often render our efforts ineffectual. Here there is no danger of pyæmia, and the most formidable objection to the use of chloroform does not obtain.

The same may be said in regard to its employment in promoting the reduction of strangulated hernia. Here we may carry its influence to a greater extent than where the powers of life may be expected to be reduced by loss of blood.

I have recently reduced the femur in two cases, dislocated upward and backward on the ileum, employing chloroform, using only the force of my own hands. The process was by manipulation as taught and practiced more than half a century ago by my father, Prof. N. Smith. It consisted in flexing the thigh forcibly on the pelvis, carrying the knee toward the opposite hypochondrium, then strongly abducting the thigh, and suddenly extending both thigh and leg. The reduction was effected in a moment.

In employing chloroform to promote these reductions its effects must be carried far enough to cause complete relaxation. Carried to a certain degree—not complete—there is produced a spastic rigidity of the muscles which renders reduction far more difficult.

I should by no means keep out of view the great advantage derived from the use of chloroform in the execution of

those operations—on the eye, for instance—which require that the patient should be completely passive and non-resistant. The most resolute can not refrain from a degree of struggle when an exceedingly sensitive organ is touched by an instrument. Here also the effect of chloroform must be complete or the effort of the partially insensible patient is more uncontrollable than ever. In all these cases, however, in which it must be carried thus far, the risk of fatal results is increased.

Nor should I neglect here to speak of the advantages derived from anæsthesia in cases of nervous and timid persons who would refuse surgical operations but for the confidence which they place in chloroform. Not only are their fears allayed, but their nervous systems are fortified against shock.—*Baltimore Medical Journal.*

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#### ARTICLE VIII.

##### *Adhesive Gold Foil.*

BY LOUIS JACK, D.D.S., PHILADELPHIA, PA.

There appeared in the February number of the *DENTAL COSMOS* a very remarkable article. It is entitled "Adhesive Gold Foil: its Discovery, History, and Use," by Amos Westcott, M.D., D.D.S., etc. It will not be a difficult task to show that, in the portion of the article relating to the discovery of adhesive foil, Dr. Westcott has made some serious mistakes in his claim, if he means that it has any connection with the practice of to-day; that he has made important omissions in the history of the subject; and on the use and application of it, he has said so little, that it is difficult to understand how it can be so important a discovery as he maintains it to be.

The character of Dr. Westcott's paper is such that a review of it might be made with considerable profit; but I prefer to confine myself to the endeavor to show that there has been no connection between what he claims to have done about the year 1840 and the important stride which has

taken place in the practice of operative dentistry since 1855. It will easily be proven that there is a distinction between the observation of an uncertain and unreliable adhesiveness which gold foil was sometimes found to possess as much as thirty years ago, and that quality of excessive adhesiveness as now regularly furnished for our use, and as now appreciated by very many operators; between the blind observance of a property which, when marked, was then considered by nearly every one a difficulty and a serious impediment, and the intelligent estimation of this valuable property, which soon occasioned it to be turned into an important aid in filling carious teeth, once a clear definition of it had been made, accompanied by methods of using gold foil which were somewhat new.

I shall also make it plain to whom we are to credit the clear recognition of the extent of this property of pure gold, and his estimation of the importance of it, and to whose efforts the dental profession is indebted for having introduced and made public methods of operating which have, in the hands of so many operators, completely revolutionized the modes of filling teeth which were in general use as late as twenty years ago. It is not out of place that I should attempt to establish the claim of the one I believe to be entitled to whatever credit is connected with the introduction of extra adhesive foil into common use in our specialty. It happened that my associations at the time were such as to cause me to be familiar with the first tangible experiments in this direction, and that I was intimate with all the steps which led to its public announcement. I feel sure it will cause no surprise to the great majority of old practitioners, when I mentioned that the present methods of using adhesive gold foil will all be carried back for their starting-point to the published statements made by Dr. Robert Arthur about 1855. Before that time the generally practiced methods of introducing gold while filling teeth were such as to render inadmissible the use of foil possessing this property in more than a slight degree. Such a degree of

adhesiveness as the bulk of dentists consider a great advantage to-day would then have been a constant source of complaint, on account of the methods of operating than in vogue. The manner of using gold then, as now, may be divided into two classes, viz., those where the layers of gold in being introduced were allowed or expected to slide upon each other, either in entering the cavity or in the after (consolidation, and those where the operator) consolidated the particles from the commencement, adding fresh pieces successively to that previously packed, until the carious cavity would be filled. This latter method was practiced by comparatively a very few persons, and only by such could any advantage be found in much adhesiveness. It could easily be shown that this latter mode did not reach a satisfactory realization until the character of adhesiveness was clearly made known, and until it was made a controllable quality by dentists; from this moment the latter method has constantly increased, and will continue to do so just so far as an intelligent knowledge of this quality fixes itself in the mind.

Any one who is not blinded by prejudice or wedded to familiar ways not easily parted from, must admit that from the time of the explanation by Dr. Arthur of the system he worked out for using adhesive gold, published from 1855 to 1857, and his expressed anticipations concerning the valuable results springing from the use of gold possessing this quality in a high degree, that a marked advance has been taking place in the quality of dental operations not previously attainable. It may be difficult for many to realize this, since it is hard for the mind to travel back into its old paths and regard them as any different from the present track. I could make clear, if space would permit, what changes have occurred in the manner of preparing cavities and filling teeth consequent on this improvement, which changes have facilitated the performance of good fillings, as well as at the same time conducing to the better preservation of the teeth.

Now it so happened, as I have intimated, that I was cognizant of the facts connected with Dr. Arthur's realization of

the great importance of the adhesiveness of gold ; and these facts, as well as all the steps and methods connected with the subject, were published at that time ; of these Dr. Westcott was aware, and yet he failed to take any notice of them in his article. It will be remembered that Dr. A. made haste, as an earnest of his appreciation of the valuable aid he found in his discovery of this property, and of the means to be used to regulate and control this adhesiveness, to publish a full statement of the whole subject. He exhibited to the whole profession how the adhesiveness could be increased and diminished at will ; how and when to use it, and when not to accept it.

The circumstances connected with his claim will be found in the *News Letter* of that period, and in his treatise on the subject published by Jones & White in 1857. Of these facts Dr. Westcott must have been cognizant ; his history of the subject is so far very deficient.

It may not be out of place here to enter into a relation of the mode of Dr. Arthur's independent discovery of this property. In the winter of 1855 I was associated with him in the practice of dentistry in Philadelphia. Dr. A. had been using "sponge gold" almost exclusively for a year previously ; and (under his direction) I had been making experiments as to the relative density of "sponge gold" and gold foil fillings. While packing some foil which had become hard and unmanageable from handling and great age, he recommended me to aneal it, when he at once observed that it adhered in the same way in which the sponge gold did—in fact, that it required the same kind of manipulation. He at once commenced to use it in precisely the same manner as he had been using the sponge gold. Dr. A. quickly recognized the full importance of this, to him, newly-discovered property of gold, and he set to work earnestly, in his usual way, to investigate its character.

Mr. David Morgan, an enterprising and faithful manufacturer of gold foil, became at once interested in Dr. A.'s views ; experimented with foil until he was soon able to

produce with uniformity a gold of far greater adhesiveness than any which had been previously made. Before this time "sticky" gold was a somewhat accidental thing, the effort of the manufacturers being to overcome as far as they were able every considerable appearance of this quality. Other manufacturers also took the matter up, and now there is hardly any but have a far greater control of their production than they were previously capable of securing.

Quickly following this recognition came the necessity for a modification of the form of the cavity, of the mode of preparing the foil previously to introducing it, and also of the instruments to be used for the purpose. The common methods would not at all answer. This was a new step in dentistry, and the history of our speciality will, when examined, show that it has been one of the most marked advances which has yet been made in it. The introduction of sponge gold and the instruments necessary to use it certainly prepared the way for the effective use of adhesive gold; but considerable modification of the latter was necessary for the use of the newly-prepared foil. All the features of the modified manipulations were carefully worked out to a satisfactory conclusion, and the results anticipated were fully realized in practice.

When Dr. A found he had fallen on a new and valuable track, he lost no time in making known all he had done, in such a way as to be of service to the whole profession; and from the appearance of his two articles referred to, the general use of adhesive foil commenced, and has extended so widely as to be accepted at the present day by almost every good operator in the profession.

From the time referred to, the term "adhesive foil" began to be used, and nowhere will it be found at a date previous to this.

Dr. A. at that time was unaware of the adhesive qualities of gold. He went into an investigation of the matter as an entirely new thing, and from my knowledge of the circumstances I am confident this was the case. Not only was it

new to Dr. A., but it was apparently entirely new to the profession ; a strong presumptive evidence of this was the interest which the subject excited at the time, and the opposition which was made in many quarters as to the advantage to be derived from adhesiveness. It will be remembered that a considerable number denounced it as a dangerous innovation ; others maintaining that it was a distinction without a difference. The first have had their answer in the modification of the methods of operating to secure the most perfect results, and the almost general acceptance of the property ; the second may be enlightened by comparing what had been written on the subject before 1855 with what has been written since.

It will be remembered by those who know Dr. Arthur and his published statements, that some twenty years ago he was in the habit of using very heavy numbers of gold, ranging from 30 to 60. The process was one of working up solidly from a starting-point in the cavity, using very sharp points, somewhat as adhesive foil is used to-day ; and yet Dr. Westcott, who, I am assured, was present at the meeting of the American Society when this method was first presented, did not take occasion to mention the application of what he now claims to have discovered long before that time. The use of heavy numbers of foil in this way was one of the steps which caused Dr. A. to use "sponge gold," and afterward again adhesive foil, around which circle he has completely traveled fully twice to my recollection.

I was a student of the Philadelphia College of Dental Surgery ; attended the two first courses of lectures in this institution, and was present at nearly every lecture delivered by Dr. Townsend, to whom Dr. W. refers. He was a man we all know as having been a foremost operator of the time, and who was enthusiastically alert for every improvement, and free in his presentation of every method of any value in that department with which he was so closely identified, and in connection with which he is so widely known. And yet I never heard him give an intimation that he knew any-



thing of "adhesive gold" until it was brought to his attention by Dr. Arthur. He could not have failed to be informed of the possession of any information of great value which was at all attainable. I remember nothing, either in his lectures or from his private conversation, that bore any more than the most remote relation to adhesive foil. I am sure he had no recognition of this quality beyond a certain small degree of adhesiveness about which there was then no uniformity. In proof of this he found Dr. A.'s methods and extra adhesiveness a difficulty he, in his established methods of operating, could not overcome. He is remembered to have stated that his brother, Charles Townsend, found the new method especially adapted to labial cavities. These facts are evidences of distinctiveness in both materials and methods.

I will call attention for a moment to the statement of Dr. Westcott, that he discovered this property accidentally about the year 1840. He states that in having a quantity of gold foil sent him by mail, the sheets of gold were found united in consequence of the leaves of paper having been removed, and that he at once accepted the hint that he might purposely take an advantage of this disposition of "sticky" gold, which has been to him of more or less service ever since. For his prescience in this I give him all credit, and the excellence of his operations all must admit who have become acquainted with them. Others as well as Dr. Westcott have recognized what he called the "stickiness" of gold, and it is unquestionably true that the productions of the better dentists of that time were due in a great measure to this property of the foil used; for, indeed, without adhesiveness in some degree, it were impossible at any time to make good fillings. But I fail to see in these facts any others than a common observation of a quality which, from the failure to fully appreciate it and work it up systematically, may be called a blind observation. Neither can I see any connection between what he claims he did then and the present methods of using adhesive gold foil. In this connection of the discovery adhesiveness, a noticeable

feature in the matter is, that Dr. W. was one of the leading men in the dental profession at the period to which he refers. It was a time, it must be remembered, when dentistry was being delivered from the occult condition in which it had been for so long a time; this was the day when the first attempts to liberalize our specialty were made, and when its leading men were emulating each other in making and publishing improvements. The American Dental Society was then established, and the *American Journal of Dental Science* was started; in the former Dr. W. was a prominent and active member; and of the latter he was for a time an editor, and through a considerable period a frequent contributor to its pages. Now, what is remarkable is this, that, at a time when he was vying with others in making public any new views of his own, this great discovery will nowhere be found mentioned. It appears surprising that Dr. W. could have been satisfied with personal conversation simply concerning such an important discovery, and the more so when the zeal usually shown by him is considered. He could not then have had an inkling of the importance of a property he now claims the discovery of, but for which he had not an intelligent appellation. I have no desire to question anything Dr. Westcott has said as to what he has done, or to detract anything from him which is his due. But when he attempts to write the history of adhesive gold foil as it has already developed itself, he has but little claim to confidence as a relator of past events unless he gives all the prominent facts connected with it.

It is also remarkable, that while Dr. W. claims the original discovery of adhesiveness, and declares it so great an improvement as would have warranted him in taking out a patent for it, that he does not avail himself of the advantages of this discovery, but uses gold in such away as to prelude the employment of foil possessing adhesiveness to any considerable degree. From my experience, if I were so limited in its use, I should endeavor to keep silent on the subject. So that it now appears that, after having discovered this valuable property thirty years ago, and having made use of it

“ more or less ever since,” Dr. W. has after his long silence, written nothing that is of the slightest value to any one who looks to him alone for instruction in the use of adhesive gold. Is it not difficult, therefore, to perceive what credit Dr. Westcott can expect to obtain for the mere fact of having accidentally discovered that gold had the property of welding in a cold state, although the discovery may have antedated that of any one else, unless he had brought it to the notice of the profession in such manner as to be serviceable to it? The use of adhesive gold has become so familiar to the dental profession at the present day, that the recollection of the disinterested spirit with which it was given to those who are now using it seems well-nigh forgotten. It affords me pleasure, as an act of justice, to recall attention to the real author of the method of using gold foil upon which most of the operators of to-day rely for their best results in their work.

In concluding, it may be stated, that it is a matter of little concern to whom we are indebted for improvements in our specialty, so long as they are well developed and clearly published ; by so doing they are rendered beneficial to all. And as the world sees, he who does not act in this manner debars himself from any claim of originality, particularly when he happens to be a member of a liberal profession.

As no idea comes down into the world fully fledged, but may be found in many places at the same time, scattered as germs, so only to that one who vivifies and develops the thought in an active and tangible way can any credit be given. When any new thing is cultivated in this manner, it is out of place and unfair for any of those who have had hold of a scattered germ to claim the maternity of the practically developed idea.

And beside, may I question whether it is not a hard thing that, while making a claim for improvements in any direction, any one should ignore those who have been investigating with some advantage and success in the same direction.

—*Dental Cosmos.*

## ARTICLE IX.

*Spontaneous Ptyalism.*

BY C. W. KNIGHT, M. D., U. S. A.

Of Post Lampasas, Texas.

On board the U.S. steamer "New England," at Havana, on the 3d February last. Mr. I. L. made me the following statement: Two days previously he had noticed that his mouth was unusually "watery;" but he had not thought much of it until waking this morning he found his pillow and night-shirt saturated with saliva. He also said that he felt a "little stiff and sore in the jaws." He stated positively—and I place great confidence in his desire to tell me the entire truth—that *he had been taking no medicine of any kind*, with the exception of two Seidlitz powders, which I had given him to relieve a tendency to constipation. On examination I found the parotids slightly enlarged and indurated with increased sensibility to touch. The gums were swollen and moderately sensitive around the molars. The tongue looked healthy, with the exception of a little whitish fur near the base. The breath was offensive, resembling in odor that of the body of an uncleanly man. On careful inspection the teeth were found to be perfectly sound, and entirely free from any sharp edges that might act as sources of irritation. Being his messmate, I knew that his diet had contained a full allowance of fresh meats and vegetables. I had many opportunities for knowing that his health had been good in every respect, excepting that his bowels had been constipated, as previously mentioned.

As treatment, I ordered a purge of rhubarb and jalap to be taken at once. Internally, a tablespoonful, every three hours, of a solution of potassæ chlor. of the strength of one drachm to the pint; this solution to be also used as a mouth wash several times daily.

*Feb. 4th*—All the symptoms much aggravated. Parotids larger and more painful; gums hot, tense, and very sensitive; tongue coated; yellowish in the centre, whitish on the edges

and tip, with indications of forming ulcers on the edges. Patient very nervous and irritable, and complaining much of pain at the angles of the jaw. Marked fetor of breath. *Rj.* Tinct. ferri subsulph., gtt. v every three hours; pulvis. ipecac. comp. gr. x, twice in the day; continue the internal and local application of the potash solution, but of doubled strength

*Feb. 5th.*—Worse. Tongue much swollen, with ulcers in several places on its edges; between three and four pints of saliva poured out during the night; parotid and submaxillary glands, enlarged, hard, and painful. The patient's appearance is pitiable, and reminds one of the description by old writers of severe cases of mercurial salivation. Ordered a nourishing diet, with a milk punch, twice a day. Continued tinct. ferri subsulph., gtt. x, every three hours, and potash solution; Dover's powder *pro re nata*.

*Feb. 6th.*—No change for the better. The ulcers on the tongue have run together forming three large sores; an ulcer on each cheek as large as a silver dollar, with rugged edges, and of adark reddish color; these ulcers present a very unhealthy apperance; ordered beef essence, with milk punch; continue iron, omit chlorate of potash, and substitute a saturated solution of chloride of sodium, with which the mouth is to be thoroughly washed *every half hour*; the ulcers on the tongue and cheeks being touched, in addition, three or four times during the day with a crystal of rock salt.

*Feb. 7th.*—From the commencement of the chloride of sodium treatment the patient improved rapidly, the frequency of application being gradually decreased as the patient grew better. The tonic regimen was kept up for ten days. He was entirely well in two weeks.

I desire particularly to call attention to the great relief experienced from the use of the chloride. At every application the patient said a cool and pleasant sensation was imparted to his mouth. He soon acquired the habit of keeping a small lump of salt in the mouth, and said it was as pleasant as a piece of ice to his parched tongue. The fetor

of his breath was markedly controlled by the salt, so that the almost unbearable odor of the cabin was soon dissipated.

I am unable to assign any cause for the complaint, unless the torpidity of his bowels can be charged with it. I have called it spontaneous ptyalism after Thomas Watson, who gives, in his "Practice of Physic," that name to a similar train of symptoms. The mode of invasion and the severity of the symptoms distinguished my case, I think, from mumps, or ordinary stomatitis.—*Med. and Sur. Reporter.*

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## ARTICLE X.

### *Sympathetic Paralysis.*

By PROF. H. R. NOEL. M. D.

Mr William F. Turner, cattle dealer, age 39, weight 194 pounds, health excellent, and of superb muscular development, March 7th, 1870, while endeavoring to open an oyster, glanced the knife, and made a deep punctured wound of the thenar region of the left hand, about the middle of the metacarpal bone of the thumb, and reaching to the bone. There was instantly a sharp arterial hemorrhage, which soon ceased, and decided pain, of an acute character, which continued. This pain crept slowly up the left forearm, then up the arm to the shoulder joint, and finally to the neck, reaching the neck in about five minutes. In an instant after the pain reached the neck, the *right hand* became acutely painful, and suddenly complete unconsciousness supervened, some slight spasm of the facial muscles, eyes open and staring, mouth relaxed and open; then a knotting of muscles and rigid tonic spasm ensued.

Involuntary discharge of urine took place. The patient regained consciousness with a feeling of intense pain in the *right hand* and none in the other *i. e.* the left hand, which was wounded; but in a few minutes the pain returned to the left also, and was equally violent in the two, right and left. Unconsciousness lasted possibly ten minutes. After the return of consciousness, as shown plainly by the eyes and

by the efforts of the patient to speak, there still remained, for a few minutes, a complete loss of control over the muscles of the head and neck, and the face had a flat, relaxed, paralytic expression. There was marked pallor, nausea, trembling and great temporary prostration. The right and left hands were equally painful now, the pain involving the thumb, first, second and half of the third finger of each hand; there was unsteadiness, a sort of paralysis agitanos and numbness in each.

The numbness and pain remained, but decreasing gradually until the third day. Upon the third day the patient said his left hand was *sore*, stiff, numb or dead; his right hand ached and trembled, but was not numb. Fourth day, but little pain or numbness, and that confined to the left hand; some soreness around the wound; muscular coordination completely restored, and patient perfectly well the eighth day.

The hemorrhage was from the princeps pollicis artery, or from a branch. The pain was from a crushing of some branches of the median nerve; but the strange element was the reflected trouble in the right hand, and I am of the opinion that the true explanation of this case would also explain the following cases, viz:

Earache in children during dentition; pain in the heel from calculus in the kidney; pain in the knee-joint from disease in the hip; paralysis of the arm from carious teeth; paralysis in the lower limbs from uterine trouble.

*Query.* Are these, cases of reflex sympathetic paralysis, and of reflex sympathetic pain? If so, are there any laws or rules, physiological or pathological, by which we can distinguish them from cases of true paralysis?—*Baltimore Medical Journal.*

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## MONTHLY SUMMARY.

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*Bromide of Potassium for the Troubles of Teething.*—The bromide of potassium is highly spoken of by Dr. Hoehling (*St. Louis Med. Jour.*) and by Dr. Caro (*Medical Record*), as a remedy for

faulty nutrition, irritability of the stomach, vomiting, restlessness, diarrhoea, etc., resulting from teething. From half a grain to a grain, given every hour or two, will, in a short time often procure relief and sleep when other means have failed. The following is selected from Dr. Caro's list of twenty cases: S. Fay nine months old, has six teeth, nursed by a healthy mother. After fifteen days of diarrhoea with from fifteen to twenty passages every twenty-four hours, was cured by a mixture of one drachm of bromide of potassium in an ounce of mucilage, twenty drops every hour. Dr. Caro adds: "I have had fifteen similar cases in every form, having been sick from fifteen to twenty days before coming to me, all treated and cured by the bromide of potassium."—*Chicago Medical Journal*.

*Cystic Tumor of the Lower Jaw.*—Dr. H. F. Lyster, of Detroit by request, exhibited to the Michigan State Dental Association a cystic tumor, composed of a portion of the lower jaw which he successfully removed in April last, in the interior of the State. From the left canine to the third molar the jaw had been expanded, on every side, to the size and thickness of a hen's egg. This change had been going on for seven years, and was supposed to have originated in irritation from an uncut tooth; and the fluid of the tumor had been evacuated several times for the relief of pain. Upon opening the tumor, after removal, a foreign body, about the size of a molar tooth, was discovered; which proved, upon examination, to be composed of salivary calculus. The operation of removal consisted in making an incision along the lower border of the tumor, and dissecting off the soft parts with the periosteum, and using a metacarpal saw and bone forceps just anterior to the canine and posterior to the third molar. The opening into the cavity of the mouth was made as late as possible to avoid hemorrhage into the pharynx. By keeping closely to the tumor, hemorrhage was avoided, and no vessel required a ligature. The dental artery was plugged in its bony canal. The dental nerve was discovered stretched across the interior of the tumor in its normal condition, but unsupported by any tissues. The tumor was filled with a mucous fluid of the appearance of saliva. The position of the chin and the contour of the face had been well preserved by moulding on binders board, and by wiring the teeth on the sound side.—*Dental Register*.



*Bromide of Potassium in Dentition.*—Dr. Salvatore Caro, in the *Medical Record*, strongly recommends the local application of this remedy to allay irritation of the gums in dentition. He says: "In the most severe cases of odontitis, either with or without ulcerated gums and loose bowels, I have never failed to relieve the child by the application of the bromide of potassium. Almost immediately after the first rubbing of the gums, from being turgid, swollen and red, they assume their natural color, and a certain amount of ease is felt. Saliva commences to dribble; and, as if by enchantment, agitation, carpopedal involuntary motion, vomiting and looseness of the bowels disappear. As the vomiting and diarrhoea in this case are not the consequence of gastro-enteritis, but of an excitement of the stomach and the intestinal mucous membrane, owing to the inflamed condition of the gums, I suppose it will never be cured, either by scarification of the gums, or by the use of astringents or anodynes; but, as I shall hereafter prove, simply by the use of bromide of potassium."

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*Stomatitis Produced by Fermented Cheese, and Cured by Lemon Juice.*—A store servant, having good antecedents, *i. e.*, having never had recourse to mercurial preparations, was brought in the service of Behier, on account of violent stomatitis. In examining the mouth, no aphthæ nor ulcerations, or grayish patches, nothing of a pultaceous nature. What was most striking was a universal brilliant redness with loss of epithelium, without tumefaction of the tissues, covered by the mucous membranes. This was alone affected. Finally, this was a simple erythematic stomatitis, but of exceptional intensity.

The patient attributed, and with reason, this buccal lesion to an excess in the eating of fermented cheese. In fact, we often meet with dried and fermented cheese, particularly those of Rocquefort and Gruyere which acquire with age irritant properties similar to those of mustard, and produce a stomatitic affection of the nature of that of which we treat.

However, happily, this is more painful than grave. It is worthy of remark, however, that when cured, the patients preserve an extreme susceptibility of the buccal mucous membranes, especially to salted ailments.

How shall we treat the stomatitis? by substitution. If we prescribe emollients, decoction of figs, marshmallow or poppy, etc., the sanguineous tufts persist with tenacity. We should then make use of excitants, alum, chlorate of potash, and beyond all citrons. In the patient of Behier the mouth was energetically touched in every direction with a piece of lemon. The blood flowed from the papillæ, but a notable change for the better was immediate, and the cure was complete on the following day.—*Journal de Médecine et Chirurgie* and *New Orleans Jour. Medicine*.

*Ulceration of the Palate in Young Patients.*—In November last, a stout healthy looking girl, eleven years of age, was under treatment in the surgical wards of the London Hospital, for ulceration at the back of the mouth, which resulted in destruction of the uvula and the adjacent soft parts. The Professor stated to his class that as ulceration and destruction of the soft palate in an adult generally indicates tertiary syphilis, so does the existence of a similar disease in a young subject at once suggest the idea of hereditary syphilitic taint. But it has been observed that destruction of the palate at an early age is very rarely if ever associated with the signs of inherited syphilis. In the present patient the teeth were not deformed, there was no keratitis, and periosteal thickenings could not be detected. If, as we have good reasons for believing, early ulceration be due to hereditary syphilis, then this lesion characterizes a group of cases quite distinct from that in which the ordinary symptoms of inherited disease, such as pegged teeth and keratitis, are presented. The most effective treatment of sloughing of the soft palate in young patients is the local application of nitric acid or the acid nitrate of mercury.—*Lancet*.

*Death from Chloroform.*—"At Accrington, on Saturday week, a young woman aged 30, named Susanna Horsfall, went to Dr. Millar's surgery to have some teeth extracted. The teeth were difficult to extract, and chloroform was administered. After having pulled out the third tooth, Dr. Millar observed that the patient was dying; and life was soon extinct. She had taken chloroform a week before, but it did not take effect."—*British Medical Journal*.

*Facial Neuralgia.*—While practicing medicine at Leiganore, Maryland, I was called 45 miles over into the vicinity of Gettysburg, Penna., sometime in April 1863 to see Mrs. Rachel Pfoutz, a lady of excellent standing and wide circle of acquaintance.

The history of this case is, that for several years previous she had been slightly affected with neuralgia, which about six months before I was called in had concentrated its forces in the dental and lingual nerves.

The skill of five physicians of good standing had failed to relieve her, and she had been abandoned as a hopeless case. Now, she could neither speak nor masticate for over two months, conversed solely by slate and pencil—while her subsistence was effected by sucking through a glass tube, a portion of wine soup and other fluid diet. Death she said was her hope. A person weighing in health 218 pounds, was now reduced to 80 pounds. Her treatment, which had been of the anti-periodic, and anti-spasmodic, and narcotic kind, had over-ruled the peristaltic action of the bowels, and the evacuations depended solely on injections. So sensitive was her nervous system that the least sudden noise produced spasms.

I saw clearly what was at first to be done—accordingly prescribed pil. comp. cath. ij., followed by sal. Rochelle ʒj. The bowels soon resumed their wonted duty, and now for a removal of the intense pain, and a tonic for the general system.

These I found in tinct. lupulin, ʒij, teaspoonful in water every 5 hours—alternating with syr. iodid. ferri, ʒj, 10 drops in water, and aconitin, gr. j, hog's lard, ʒj. M. Ft. ung. Applied over the seat of pain. She spoke instantly, and said she was cured. The pain ceased instantly upon the first application of the ointment.

Her improvement under this course was rapid, and soon she was well. But I found in June following that there was a disposition in the nerves to resume the painful task, as the aconitin began to lose its effect.

I determined to operate at once, and addressed to Prof. S. D. Gross, of the Jefferson Medical College, a letter as to the matter. On receiving his reply, I took my patient to Philadelphia. The eminent Professor named, incised, trephined, divided behind the bifurcation, and lifted out the dental nerve.

The patient returned home in a week, enjoyed good health a

long time, but from a letter I received from her a few years ago, she tells me she suffers again some at times, but no comparison to the first—as life is since a pleasure, whereas, before our treatment, 'twas but a living death. I believe such treatment worthy of adoption.—*Dr. P. J. Gardiner in Medical & Surgical Reporter.*

*The Oldest Relic of Humanity.*—The oldest relic of humanity extant is the skeleton of one of the earlier Pharaohs, encased in its original burial robes, and wonderfully perfect considering its age, which was deposited about 18 or 20 months ago in the British Museum, and is justly considered the most valuable of its archæological treasures. The lid of the coffin which contained the royal mummy was inscribed with the name of its occupant, Pharaoh Mikerinus, who succeeded the heir of the builder of the Great Pyramid, about ten centuries before Christ. The monarch whose crumbling bones and leathery integuments are now exciting the wonder gazers in London, reigned in Egypt before Solomon was born, and only about 11 centuries or so after Mizraim, the grandson of father Noah, and the first of the Pharaohs, had been gathered to his fathers. The tidemark of the deluge could scarcely have been obliterated when this man of the early world lived, moved and had his being.—*Medical Record.*

*Sulphate of Nickel in Neuralgia.*—A case of obstinate neuralgia is related which was cured by sulphate of Nickel, in doses of half a grain, three times a day. At the end of a week a dose of one grain was given. Its sedative action was speedily manifested in reducing the pulse and procuring sleep. All symptoms of the paroxysm disappeared. The remedy seems worth a trial.—*Physician and Pharmaceutist.*

## EDITORIAL DEPARTMENT.

*Sir James Y. Simpson.*—While the literary world is grieving over the loss of Charles Dickens, the medical is mourning over that of one of the greatest men of the age, the news of whose death sent a thrill of regret over every part of the globe where medicine is scientifically practiced.

We glean the following sketch of the life of Dr. Simpson from European exchanges :

Prof. Simpson was born at Bathgate, in 1811, of respectable but by no means wealthy parents, he raised himself entirely by his own exertions to the position of highest eminence in his Profession.

The system of the Scottish Universities rendering education there more accessible than in the sister institutions in England, it is not unusual for the sons of the better class tradesmen to be sent to complete their schooling by attendance on some of the university courses in Edinburgh or Glasgow. In this way young Simpson, aided in a pecuniary sense by his elder brother, was sent to the University of Edingburgh, and became a member of the humanity class there, under Professor Pillans. The venerable Professor Pillans always believed that his counsel and encouragement at this time had greatly influenced Simpson's subsequent career, and he used to relate with great unction how, impressed with the versatility of his pupils acquirements, he had urged him to compete for a Stewart bursary, a scholarship which carried money with it, and being tenable for three years, helped the holder to continue his studies in the University. To succeed required extended study of classics, which might well have deterred an aspirant from a country school, but Simpson carried off the bursary, and eventually became a student of medicine.

He took his M.D. degree in 1842, and became assistant to Professor Thompson in the chair of Pathology. Thus he became familiar with a branch of scientific Medicine which constitutes the very foundation of sound Medical practice. He lectured sometimes in place of the Professor, and even then gave indications of originality, and of a desire to advance beyond the then received teachings on a subject as yet in its infancy.

Soon after this he began practice, and became a lecturer on Midwifery in the extra-Academical School of Edinburgh. He continued as an extra-academical lecturer for three years, when, in 1840, he was elected Professor of Midwifery in the University of Edinburgh after a severe competition. Some sort of idea may be formed of his perseverance and energy at this time by looking over the testimonials he offered to the patrons of the university as a candidate for the chair. The whole constitutes an octavo volume of more than 200 pages, and in it are to be found certificates of recommendations from all the principal Professors and teachers both in this country and on the Continent, showing that, even at this early period of his career, his reputation was established. In the same volume is a catalogue of his private museum, formed, he states, in the short space of three years, which occupies more than sixty pages, and consists of nearly 700 obstetric preparations.

At home, his consulting rooms were crowded with patients

who had heard of his fame, and who came from all quarters of the world to consult him. Medical men came from every country eager to see something of his practice, and to have the pleasure of an interview with so celebrated a man.

It was possible to meet Sir James without being impressed with the diversity of his attainments and his almost universal knowledge. His memory was prodigious. It was remarked he was always the first to know about all new scientific inventions, and that he was in advance of his neighbors in information on all sorts of problems, political, scientific, or religious. To notice all his Professional works would take more space than the limits of this brief memoir can afford.

The great feature in all his contributions is their originality and wonderful lucidity of expression. The most ordinary topics of Medical discussion shone out in a new light, when illumined by his touch, and matters of apparently trifling significance assumed an unsuspected importance under his treatment. He was constantly breaking new ground, and in doing so often ran counter to former notions and old prejudices.

But it is the introduction of chloroform as an agent for allaying the pangs of parturition and abolishing the pain of operations, Surgical and obstetrical, that will render Simpson's name most famous in public estimation hereafter, and rank him as equal with Harvey, Hunter, and Jenner. His other efforts and successes for the benefit of humanity can only be vaguely mentioned in ordinary conversation; this great boon can be understood and appreciated by all. Who can compute the sum of mortal agony which this single discovery has been the means of erasing from the lot of humanity?

Hearing of Morton's and Jackson's experiments with sulphuric ether in America, Simpson deliberately set himself to find some other agent which might be free from the disadvantages of ether. Taking his life in his hand, he fearlessly tried the experiment on himself of inhaling various substances, likely and unlikely, until, after various perils and disappointments, the discovery of chloroform was made. What in ancient or modern times, has been more striking as a scientific discovery or a greater boon to mankind?

Sir James was not without recognition of his great merits during his lifetime. For his discovery of chloroform he was, in 1853, elected a Foreign Associate of the French Academy of Medicine, and in 1856 he received from the French Academy of Science the Monthyon prize of 2000 fr. "for the most important benefit done to humanity." For the same cause he received the Royal Order of Knighthood of St. Olaf from the late King of Sweden. In 1866 he was created a baronet by her Majesty Queen Victoria, and, in the same year, he received the D. C. L. of Oxford.

In 1869 the freedom of the city of Edinburgh was conferred upon him as a special honour by his fellow citizens. He was President of the Royal College of Physicians in Edinburgh in 1849, of the Medico Chirurgical Society in 1852; he held the appointment of Physician Accoucheur to the Queen in Scotland; was Foreign Associate of the Academies of Medicine in Belgium and New York, Hon. Fellow of the King's and Queen's College of Physicians, Ireland, and member of a legion of other learned and scientific societies.

The immediate cause of Prof. Simpson's death was angina pectoris, associated with heart disease. He suffered severely from paroxysms repeated from time to time for some weeks previous to his death, and bore the pain with exemplary fortitude.

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*The Pneumatic Bur Engine* which was exhibited at the meeting of the "Southern Dental Association" in New Orleans, is favorably noticed in an editorial by Prof. Taft. He says "we have had in use one of these instruments for about two months, and can not but express our entire satisfaction with its working, especially so far as the operation of the finishing bur is concerned. It is a great labor saving appliance in the work of finishing all fillings where the bur can be brought to bear; it also reduces the time of finishing to less than one-half that required by the ordinary mode, besides doing the work better. It also operates the excavating bur and drill very efficiently and rapidly. The construction is such that the burs and drills may be run at any angle with the main shaft that may be desired, so that posterior surfaces may be reached quite as well as anterior when the contiguous teeth will permit. There is also an attachment for using the file and the plugging instrument: with these we have no experience, and are not prepared to speak of them, but so far as we have become familiar with the instrument, we regard it an invaluable one, and should be in the hands of every good operator. Dr. E. R. E. Carpenter of Chicago, will furnish them, or give any information that may be desired."

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*American Dental Association.*—Dr. E. W. Bogue Chairman of Committee of arrangements informs us that the Erie Railroad Co. has agreed to sell tickets to those wishing to attend the American Dental Association at Nashville, Aug. 2nd, for half price, that is \$34, for a ticket from New York to Nashville and return, good for 30 days.

All living in New England or near New York, at any point can obtain tickets at this rate by sending money orders for the amount named to G. F. Phelps, Ticket agent of the Erie R. R. No. 957 Broadway, New York City.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.      THIRD SERIES--AUGUST, 1870.      No. 4.

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ARTICLE I.

*Diseases and Treatment of the Dental Pulp.*

By F. Y. CLARK. D.D.S. of Savannah, Georgia.

Read before the Southern Dental Association.

There is no operation that the Dental practitioner is called on to perform of more importance to himself and patient than the restoration of a tooth to health and usefulness, after the exposure of its lining membrane. When we turn back in Dental History some twenty years, or more, and view the treatment of exposed pulps, in comparison with the treatment now we may reasonably open our eyes in wonder and admiration. In those days it would have been considered absurd, if not quackery, to talk about and advocate the practice now in vogue, and we sometimes think could some of our old "sober-sided" predecessors but awake from their sleep, as did Rip Van Winkle, that they would find themselves as much out of place in the ranks of our profession as did this good old gentlemen amongst his former friends of the Hudson.

With these preparatory remarks, we will now consider the exposure and treatment of the dental pulp in its various conditions, and give our manner of treatment; but in



doing so, we hope we will not be considered as claiming any better practice, or more success, than many others; but merely as explaining our mode and giving our experience that others may compare it with their own, and adopt, or reject it, as their own good judgement will indicate.

Where there is simile exposure of the dental pulp, caused by accident in excavating or in any other case, no matter how caused—provided there is, or has been, no inflammation—we consider the best course in all such cases, to attempt to save the vitality of the tooth and induce, if possible, ossific deposit. In doing this, a great deal of care and nice manipulation is necessary in removing decay and detached dentine from over and around the pulp. Should any detached particles be forced into the canal, or on the pulp, so as to irritate, inflammation and failure is sure to follow. A drop or two of blood will do no harm, but sometimes will prove beneficial. After all loose decay is removed, the cavity should be flooded with some one of the essential oils—we generally use sulphuric ether or spirits of camphor, particularly where there is no pain. After this creosote should be used, allowing it to remain two or three minutes; it is sufficiently escharotic, and its antiseptic properties are about what is wanted. As a general rule, we do not approve of temporary fillings in this condition of the pulp; we think a temporary filling indifferently put in is much more liable to cause trouble than a permanent one carefully introduced. If care is taken, a good permanent filling may be put in with as much, or more, safety than a temporary one. The gold should be packed carefully over and around the exposed part, so as not to produce pressure on the membrane. In doing this, the *modus operandi* will have to be varied according to the case. What will apply to one will not to another. So as pressure on the exposed point is avoided, is all that is necessary. A way to do this will suggest itself to the mind of every intelligent operator. If the cavity is one that can be seen, and there is a fair chance to operate, a good permanent

filling may be introduced without much fear of trouble; but where a full view of every part can not be had, it is no doubt better to fill the floor with os-artificial, and then, when this hardens, with gold.

The second condition of an exposed pulp is one that has been exposed for some time. The tooth may have ached at different periods, and may be in an aching condition at the time of treatment. The least pressure or contact with cold fluids will produce pain. The exposure and decay is more extensive than the one just described; but the periosteum is not implicated. In this class of exposure, we consider our treatment almost certain, and do not look for trouble with one case in twenty. We proceed first to excavate around the margin of the cavity, removing as much of the decay as is practicable without pain, shapeing the walls of the cavity so that it will retain the application. In placing our preparation on the nerve, which is composed of the usual arsenious paste, our aim is to avoid pain and the action of the arsenic on the dentine. In order to do this, we take a plug of wax, giving it a cone shape and making a hole through its center large enough to admit the point of our ordinary excavator; we then pass a small bit of common wrapping cord through the hole, allowing the end on the cone side of the wax, which is to go into the cavitiy, to project a very little beyond the wax, so that in placing it into the cavity the end of the cord, on which there is a speck of paste, will come in contact with the pulp, first with a chisel-like instrument slit from the point up the center half an inch, so as to admit the outside end of the cord, the wax is placed in position, the cord withdrawn and the wax on the surface flowed by a warm instrument. Thus it will be seen the arsenious paste is brought in direct contact with the nerve, and when the cord is withdrawn there is a small vacuum, thereby avoiding the pain as is usually produced by pressure. This little auxiliary, in the hands of a neat operator, will prove of great advan-

tage; but with a bungler it will be no better than cotton and varnish or other things generally used.

We prefer making the application to the pulp in the morning, allowing it to remain until the next day afternoon, from twenty-four to thirty hours.

On removing the wax, the partition over each root should be broken down and excavated away, so as to give a full view of the interior, if possible. The pulp should not be mangled up, as is generally the case, for then it will have to be taken away in fragments, giving considerable pain, and frequently considerable trouble. If it is in a flabby state, so that it can be wiggled about without any or much pain, it should then be removed at once. In this consideration, if proper instruments and care is used, it will generally come away whole, leaving the root at the foramen: but sometimes we do not find this condition of affairs. We may be obliged to inflict considerable pain, the pulp may come away in fragments, and there may be considerable bleeding; but on completing the removal, if the pain and bleeding disappear and there is no other unfavorable symptom, we do not hesitate to fill at once, being convinced by experience that it is much better to do so than to delay until a second or third setting. If, however, owing to the constitution or temperament of the patient or to some unforeseen cause, as is now and then the case, vascular excitement is produced and periosteal inflammation threatens, we should not be at a loss to know what to do, or in the least despair of success. The first stage of trouble is the time for preventative treatment, and if remedies are properly and timely applied, periostitis or an alveolar abscess may nearly always be prevented. If the system is disordered or in an inflamed condition, a cathartic along with the application of iodine and aconite to the gum adjacent to the affected tooth; two parts of comp. tinct. of iodine to one of aconite. This should be used with a little brush, keeping the mouth open until absorption is finished. If one or two applications of this fails to give relief, and there is considerable inflam-

mation, and apparent engorgement of the surrounding vessels, their thorough depletion over the affected part will, in most cases, give relief and allay the excitement. We generally deplete by making a deep incision in the gum, immediately over the apex of the root, and when the bleeding has fully subsided, insert a pledget of cotton into the opening, this will act as a counter irritant, and, in the course of a few days will come away. If this fails to relieve the trouble, we either trephine the alveolus or turn our attention to the encouragement of an abscess, or extract the tooth.

We now come to another or third condition of the pulp, which gives more trouble, on account of its not being understood, than any other state in which it is found. We allude to that class of teeth where the pulp is devitalized and where a discharge has been going on for months and perhaps years; where there is, or never has been, a fistulous opening. There are several varieties of this class—some without any apparent discharge whatever; others, again, whose discharge is extensive and offensive; but as the same treatment will apply to all, we will therefore treat of them under one head. Years ago, with this class, we with many others were in the habit of feeling our way along the best we could, with nothing reliable or certain to guide us. We knew we had much better success by a mild course of treatment than by a more heroic one, but did not know why. The age, temperament and habits of the patient, along with a cheerful willingness to go halves in the risk, were our most reliable assistants; but now we think we understand them better, and believe we know the cause of the trouble. In this class of teeth the roots are encumbered with debris and morbid matter, and it is usually the course to attempt the removal of this debris by a barbed instrument at the first sitting, working the instrument up and down, pump-like, thereby either choking up the foramen and causing the discharge to hunt another outlet, or forcing particles or gases through, creating vascular excitement, periostitis and alveolar abscess, or the loss of

the tooth. Again; the foramen, in this condition of tooth, owing to a current of corrosive matter passing through it, is somewhat enlarged, and it is not unfrequent that the fine hair-sized broaches used, are passed through, irritating the parts beyond which are generally in a state to inflame on the slightest provocation. Now, as the aggravation is produced by closing up the natural opening for the pus in the process of barbing out the root, or by forcing an instrument or gases through, irritating the parts above the apex, it is clear to see if this is prevented no trouble will ensue.

The first attack upon a tooth in this condition, after making a clear opening to the mouth of the pulp canal, should be made with injections of warm water, followed with a mild preparation of carbolic acid, compound tinct. of iodine, glycerine and water. The following is the formula which we use; carbolic acid, gtt. 8; compound tinct. iodine, gtt. xv; glycerine, ʒ vij; water, ʒ vj. After a free use of this, the tooth should be packed with cotton for a day or two, then washed out with this preparation again, and the root filled with a thread moistened in creosote, and a temporary filling of gutta-percha, or Hill's stopping. It should be allowed to remain in this state for several days. If at the end of that time there is no offensive odor, the root may be barbed out and filled without fear of further trouble; but if, as is now and then the case, creosote is not strong enough or sufficiently antiseptic to remove all odor, it may be increased in strength and action by the addition of a little carbolic acid and it may be increased in strength at will. It is best in this condition of teeth to keep up the antiseptic properties of the creosote for some time, and therefore it should be introduced with the filling.

We now come to another class of teeth with devitalized pulps, which differ from the last by having an outlet through the alveolus and the gum, through which the morbid matter passes, instead of through the root, as in the ones just treated. The main point in the treatment of this class con-

sists in breaking up the disorganization at the end of the root, and curing the fistula. This can generally be accomplished at one sitting, without fear or risk. A small hair-sized nerve instrument should be passed through the foramen, until there is a slight indication of its touching the parts beyond. A barbed instrument, with a little cotton wrapped around it, and dipped in creosote, should then be introduced, and moved up and down until the creosote is seen to come out on the surface of the gum, through the fistula.

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## ARTICLE II.

### *Notes from Dental Practice.*

By JAMES B. HODGKIN, D. D. S. Alexandria Va.

#### *Health Restored by the Extraction of Diseased Teeth.*

Mrs. R. aged 38 called to see about her teeth. She had been suffering for a long time with distressing pains in her head, which had been so great a torment to her as to render her life a burden. Her sight was much affected, the eyes being red and watery, and her hearing also was impaired. On examination all the upper teeth were found decayed so badly as to permit no hope of their restoration, most of them being mere stumps; she stated that they had not given her any particular trouble and that her physician had told her she had better have them extracted, this was done with all the stumps save two, which from the difficulty attending their removal and her sensitiveness were left remaining. She was requested to call in about three weeks when they would probably be in a better condition and her nerves more firm. She called at the time appointed and expressed herself much gratified with the results of the operation she had submitted to, as her troubles were much mitigated, hearing and sight improved, and the distressing pain in her head almost gone. The remaining roots were now removed, and she decided to wait until she could have a permanent set of teeth before

having the plate constructed. At the appointed time Mrs. R. called to have the artificial teeth constructed, and stated that the restoration of her health was entire, and has been since, a period of two years.

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*Iron Retorts for Nitrous Oxide.*

The fifty gallon gasometer sent me from the manufactory of Snowden & Cowman, a year or more ago has answered my purpose excellently well, as did also the glass retort accompanying it—until it broke, which was not long. After exhausting the supply of a firm here, at the rate of about one a week, as all the retorts not in the private use of druggists and others were used up, I concluded that if a more substantial material would answer I would try and obtain an unbreakable retort, and accordingly ordered a 20 ounce iron one as a sort of experiment. I am proud to say that after several months use of this latter material I think it quite as good as glass; a little less convenient perhaps, as one has to graduate the heat by the judgement, not being able to see the condition of the contents of the retort, but with a little practice this and other difficulties are overcome, and a very excellent article of gas is made without the constant dread of breakage formerly felt. I don't try to have "the gas fresh every day" however, as I find that when I can keep it a month it is pleasanter and fully as efficacious, while that six weeks old is still better. I was not a little amused a short time ago, at the faith of a lady in a Chicago dentist's statement, made to her while visiting that enterprising city, to the effect that she must never under any consideration allow a dentist to give her any other gas than that made the day before being taken, or if possible made the same morning it was inhaled, as all gas not perfectly fresh was highly poisonous. Finding her faith well founded in Chicago "gas" I let her use, wondering to myself if the world ever would grow wise enough to take down the sign hung at every door: "Premiums awarded to humbuggery."

To return to the retort question, if some manufacturers would make a flask shaped retort, porcelain lined, it would sell well I am sure. I find the inch gas-pipe which conveys away the gas from the retort to the wash-bottles is corroded quite rapidly by the action of the decomposed salt. A retort shaped like an old-fashioned glass one, with a short neck and porcelain lined would be just the article needed.

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ARTICLE III.

*The Death of Dr. W. L. Bowdoin.*

At a meeting of the American Academy of Dental Science, held in Boston, June 7th 1870, the following resolutions were unanimously adopted:

WHEREAS, The "American Academy of Dental Science" has received the sad intelligence of the sudden and unexpected decease of our esteemed friend and associate, Dr. W. L. Bowdoin, of Salem, Mass., therefore,

RESOLVED, That we have heard with the deepest sorrow of the death of our fellow member, Doctor Willard L. Bowdoin, who has departed in the prime of manhood, in the fullness of his usefulness and professional success.

RESOLVED, That while we bow in reverent submission to the will of Almighty God in taking from us our beloved friend, we deeply deplore the great loss we have sustained in his death.

RESOLVED, That by his death, the profession of dentistry, to which he devoted so many years of his life, has lost one of its brightest ornaments, the community in which he lived has been deprived of the valuable services of a skilful practitioner, and our society has been bereft of an highly esteemed member.

RESOLVED, That we his fellow members of the Academy, to whom he was greatly endeared, will affectionately cherish his memory, and will ever retain in happy remembrance his bright Christian example, his high reputation for honor, integrity, and professional courtesy, his retiring and genial disposition, his kindness of heart, and the many other virtues which adorned his character.

RESOLVED, That we tender to the family of Dr. Bowdoin,



the assurance of our deepest sympathy in their heavy bereavment and affliction, and our heartfelt expression of sorrow and condolence.

RESOLVED, that these resolutions be entered upon the records of the Academy, and a copy of them be presented to the family of the deceased and that they be published in the American Journal of Dental Science, the Dental Cosmos, and Salem papers.

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## SELECTED ARTICLES.

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### ARTICLE IV.

#### *The Physiological Action of Protoxide of Nitrogen.*

By JOHN. J. COLTON, M. D., of Philadelphia, Pa.

It has been a disputed point among scientific men, ever since the protoxide of nitrogen came into general use as an anæsthetic, whether its action depends upon oxidation or whether the carbonic acid generated by the ordinary disintegration of tissue, or, by superoxydation, produces the anæsthesia. Eminent gentlemen in this country and Europe have maintained (and with some plausibility) that carbonic acid, by its action upon the nerve centres, produces the anæsthesia, arriving at this conclusion from the fact that evidences of asphyxia, are in some cases, so manifest, while others have held to the theory of oxidation.

Having administered this gas to many thousands of persons, hundreds of times during as many successive days, and having carefully watched its effects upon the system under the greatest variety of circumstances and conditions, I have maintained that its action must depend upon oxidation and that the indications of asphyxia (slight in ordinary cases) are merely an incidental effect rather than the main cause of the anæsthesia.

The following experiment, it seems to me, clearly establishes this theory.

Exp. 1. Take two jars of equal size filled with lime water, pass a definite amount of air, as it comes from the lungs, through one solution, and it is rendered turbid ; pass an equal amount of nitrous oxide, as it escapes from the lungs, through the other solution, and it is also rendered turbid, but to a greater degree than the first, indicating the presence of carbonic acid in greater quantity.

Exp. 2 Breathe through a tube into a solution of litmus blue, and it is changed to red. It will take, we will say 15 seconds, to effect the change (the time depending upon the strength and quantity of the solution). Now breathe nitrous oxide gas through another solution of the same strength and quantity, and we shall notice the change of color in from 10 to 12 seconds, indicating the elimination of carbonic acid to a greater extent than the normal amount, while breathing the gas, as in the first experiment.

Exp. 3. Take a full inspiration of air, retain it in the lungs one minute, and there are no indications of anæsthesia. Now try the same experiment with the gas, and the anæsthetic effect is manifest almost to insensibility while there are no indications of asphyxia.

We have thus demonstrated, by the first two experiments, that while breathing protoxide of nitrogen, an increased amount of carbonic acid is exhaled, and as this excess *must* be produced by oxidation, we *reasonably* infer that the action of the protoxide is oxidation ; and the third experiment furnishes corroborative testimony, though of a negative character ; for if the retention of carbonic acid cause the anæsthesia why are there not some indications when air is retained in the lungs ?

If we inhale pure nitrogen, we still exhale carbonic acid for a time, owing to the union of the oxygen previously introduced into the system, with the carbon and hydrogen of the tissues, but the amount is sensibly diminished. Now, this diminished amount of carbonic acid might have been anticipated, since we have not furnished sufficient oxygen

to produce the normal amount. But on the other hand, when we find an increased amount of carbonic acid we infer a corresponding increase of oxidation.

But it is objected that nitrous oxide is not a mixture of gases like the air, but a chemical compound, and therefore it does not act by oxidation. Let us see. Exp. 4 Plunge a lighted taper into the gas, and it burns with greatly increased brilliancy; the heated elements of the taper presenting a stronger affinity for the oxygen than the nitrogen does, take it and form the new combinations, carbonic acid and water. This fact shows the affinity of the elements composing nitrous oxide to be feeble.

Reasoning, now, from analogy, we might be led to infer that similar results would follow the introduction of the gas into the system, and such we find to be the case. The oxygen of the gas, by its stronger affinity, seizes upon the carbon and hydrogen of the tissues, with the same results of combination as in the case of the taper; in other words, we have superoxidation.

But it is objected that *pure oxygen* exerts a less powerful action upon the system than the gas which is two thirds nitrogen. The answer is simply, that the blood absorbs but a small percentage of oxygen, so that when it is introduced into the lungs it finds its way into the system slowly, while nitrous oxide is rapidly absorbed and conveyed to the tissues to be given up for combination.

Exp 5. If one takes a full inhalation of the gas, he instantly feels a thrill throughout the entire system. This is the incipient stage of anæsthesia, and the rapidity of its action is another proof of the theory of oxidation, for if these sensations were caused by the accumulation of carbonic acid, we should hardly anticipate such a result in the course of a few seconds.

It is still further objected that the asphyxiated appearance of persons under its influence, indicating a superabundance of carbonic acid in the system, suggests, at least, that it is the cause of the anæsthesia. The third, fourth, and fifth

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experiments furnish proof of the absurdity of this conclusion.

Moreover, the principle evidence of asphyxia ordinarily manifested is the cyanosed tint of the lips, which is in part, produced by pressure in holding them tightly upon the inhaling tube, while in certain cases, in which these evidences are more striking, there is a cessation of breathing caused by the tongue falling back upon the epiglottis; by removing this obstruction, and allowing the patient a breath of air, the symptoms of asphyxia disappear. If the inhalation be prolonged to extreme limits, we shall also notice the asphyxiated appearance owing to the accumulation of carbonic acid.

The above indications furnish the main argument in favor of the carbonic acid theory. That there accumulates in the system a larger than the normal amount of carbonic acid is evident, and this is entirely consistent with the theory of oxidation, but this accumulation is not in sufficient amount in ordinary cases to attract attention, certainly not enough to produce profound insensibility. Moreover, the effects of nitrous oxide upon the system are not such as we should anticipate, were they caused by the action of carbonic acid, for it is depressing in its influence. Even if a slight impediment is offered to its elimination from the lungs, "a feeling of discomfort and depression increasing with the duration of the interruption is speedily felt."

Now, while inhaling the nitrous oxide, although there is an increase of carbonic acid in the system, yet, if it be in sufficient amount to produce anæsthesia, how shall we explain the immediate reaction, and the agreeable sensations while inhaling, as well as for some time subsequent.

In the ordinary use of stimulants, there follows "a period of depression corresponding to the exaltation of the functions excited," yet persons who have submitted to the influence of nitrous oxide give no indications of this character. On the contrary, there ordinarily follows a period of exhilaration, just what might be anticipated from an excess of oxygen.

The system resumes its normal conditions as soon as the

oxygen has been disposed of by union and the carbonic acid and other products of oxidation eliminated, which process is very rapid—while chloroform, ether, alcohol, and other narcotics and stimulants linger in the system much longer, and by their prolonged action upon the nerve centres, produce their depressing effects and obstruct oxidation.

But the wonderful power of the nitrous oxide yet remains to be explained.

It is a well-known principle of chemistry, that elements in the nascent state, just liberated from union, exhibit remarkable characteristics and properties.

Nitrogen and hydrogen, for example, placed in a jar together, manifest no affinity for each other, and cannot be induced to unite even by the application of the most intense heat—but let them come together just at the moment of liberation from other compounds, and they combine with the utmost avidity. This is the precise condition in which the oxygen of the protoxide is found, as it enters into combination with the tissues of the body—just liberated from its union with nitrogen, it is in its nascent state—the active condition, and thus it exhibits its extraordinary powers of oxidation.

I have in this brief and cursory manner endeavored to prove, (1) that persons breathing protoxide of nitrogen exhale a larger amount of carbonic than while breathing common air: and (2) that its action is essentially oxidation, and that the excess of carbonic acid in the system is merely incidental, and in nowise sufficient to produce anæsthesia; and, (3) that its inoffensive effects are due to its action as an oxydizer; and (4) that no subsequent depression follows but rather a rapid reaction; because, acting by oxidation, the products of its combinations are speedily eliminated from the system; and, (5) that its remarkably powerful action is due to its entering into new combinations, just at the moment of its liberation, when in its nascent state.

I shall reserve for a future article what I had intended to

say of its uses and abuses, and close by expressing my profound conviction that the pure protoxide of nitrogen, administered within proper limits, is harmless in its action, while if made from contaminated materials; if at too high a temperature; if used immediately after it is made; if the impurities ordinarily found in it be not removed; if inhaled in sufficient quantity to produce profound anæsthesia, after being prepared for a few days, or if the administration of the *pure gas* be persisted in beyond *certain limits* it is capable of an immense amount of mischief. At the same time I would, express the earnest desire that a free and full discussion of the subject may afford a better knowledge of its physiological action and increase its value as an agent for the relief of human suffering.—*Medical and Surgical Reporter*.

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#### ARTICLE V.

##### *Aluminium as a Base for Artificial Teeth.*

By J. A. HODGEN, Lexington, Ky.

Several Dentists wishing to know my experience in the use of aluminum as a base for artificial teeth, I give it with pleasure, though it is not so extensive as I could wish.

I have been using it for more than a year, and have many patients wearing it who are well pleased with it. I wore it myself in an upper plate for a few weeks. I could feel or taste no difference between it and gold.

Its qualities are such that the secretions of the mouth have no effect on it, so far as my observation extends.

The acid contained in the plaster, in vulcanizing, has less effect on it than on twenty-carat gold. It is tasteless, and a good conductor. It is very easily manipulated with plates, being softer than gold or silver, it strikes up well. I have some objections to it, however, the chief of which are: first, it is hard to polish; second, difficult to solder; third, not quite so hard as we could wish.

The first objection can be overcome by a little more industry and labor than for gold and rubber plates. The second can be remedied by using the rubber attachment or the star solder, or casting on the teeth with adamantine. The latter plan I prefer for lower sets, as we want them heavier than rubber plates are generally made. For partial sets, I use the star solder or my own, either answers a good purpose. The cast attachment will make some upper sets too heavy in cases that have lost much of the alveolus, and when we wish to restore its shape. The third objection I hope will be alleviated by some addition to the aluminum to harden it. Silver will do it, but it is not pure enough and it makes it more brittle; yet I think it will do much good in a small proportion.

This, however, is not much objection to it. When it is struck up and left unannealed, it is much harder and stiffer. When we want clasps in partial sets, I have the plate thick, to give strength to them—18 or 20, of our common gauge. It swedges up much easier than gold or silver, and annealing makes it much softer.

As to a comparison between it and rubber, I regard the former as being far superior; for, whereas the rubber is brittle and easily broken, and filthy by absorption and slow decay, the aluminum is strong, pure, tasteless and a good conductor. We know that rubber is a poor conductor. This must have the effect, in some cases, by the retention of a superabundance of heat, to produce inflammation of the mucus membrane underneath the plate.

I have examined a great number of cases within the past several years, and my observation is that we can see some traces of inflammation, in about nine cases out of ten, in the membrane, under the plate. I have had several cases where the inflammation was so great as to produce intense redness, thickening of the membrane, and smarting and burning under the plate; also a few cases with all these symptoms attending the use of lower plates. I feel satisfied, partly

from this last circumstance, that the nonconducting properties of the rubber are not the only cause of this inflammation, as the space covered by the rubber on the lower jaw is so narrow that the heat can readily escape. We must, therefore, look for the cause elsewhere.

Now, when we consider that the rubber is so largely composed of sulphuret of mercury—one third, I believe—and worn constantly in contact with so delicate and sensitive a membrane, it is marvelous that there is not more mischief done.

I find again, in some cases, a great paleness—as if scalded—of the membrane, directly under the plate, showing loss of vital action.

I am glad to see that some Dentists are occasionally holding up these effects of the rubber to the public, that they may take warning not to use it in plates for artificial teeth.

If it be true that the rubber has such deleterious effects on our patients, is it not morally our duty to desist from making it and substitute something better? But they are so easily made, and the material so cheap, it will be a difficult thing to get all the Dentists to quit making it. Many there are who only know how to make these, and to think of changing to metal plates that require so much more labor, cost and skill, they will hardly be persuaded, against their wills. But, to aid as much as I can in a reform move, I will give, in my next, with more minuteness, my plan of manipulating the aluminum into plates, with my improved die metal, &c. with this metal it is easy to get a plate ready to try on in forty or fifty minutes after the impression is taken.—*Dental Register*.

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## ARTICLE VI.

### *The Administration of Anæsthetics.*

By A. ERNEST SANSON, M. D.,

Physician to the Royal Hospital for diseases of the Chest, &c. &c.

The public as well as the professional mind seems at the present time to be passing through one of those phases of ter-



rorism which, induced by the news of a death during the administration of chloroform, occur from time to time. It is vain to adduce the argument that, considering the vast number of times in which an anæsthetic is administered with comfort and safety, the danger is, proportionately, exceedingly small. If but one in ten thousand die, it is right that one death awaken all our powers to avert the danger from those who come after.

It is a right time that we should take a retrospective glance, and attain an estimate of the present position of anæsthetic agents and their administration.

In the first place, we are not, as formerly, confined to the use of one agent. To ether succeeded chloroform, to chloroform amylene, tetrachloride of carbon, bichloride of methylene, nitrous oxide, besides many other agents less widely known, and various mixtures and superadditions of one anæsthetic and another. Chloroform, the most widely employed, takes almost all the blame of the disasters. To my mind, we are too much disposed to look upon the production of a state of insensibility, for the performance of a surgical operation, as the administration of an agent rather than the induction of a state or condition. It is not the administration of chloroform, but the induction of anæsthesia which is required. We have a power of selection now, which was not possessed in times past; a fatal case points less to the failure of an agent than to the imperfection of a system.

The first rule for guidance is—

A. The choice of an anæsthetic agent should be regulated by the condition of the patient and the requirements of the case.

If it be desired to relieve pain, as in headache or the slighter forms of neuralgia, I know no better agent than tetrachloride of carbon, whatever be the condition of the patient. If an operation of short duration is to be performed, the administration of nitrous oxide is probably the most indicated. This has the properties of quick action, induction of deep insensibility with rapid recovery. The use of this

agent requires, however, apparatus and time for arrangement; it cannot be a measure for the many and for the moment. Yet, largely used as it is by dentists, it takes away from the general dangers of anæsthesia, by withdrawing from the greater risks of the other anæsthetics, a large class which was proved to be in aforetime peculiarly prone to danger. Certain conditions should, however, in my opinion, preclude the administration of nitrous oxide; these are pulmonary congestion, cardiac affections, and cerebral affections. When an operation of uncertain or of long duration is to be performed, the chief agents are ether, bichloride of methylene, and chloroform. Our data as to the bichloride of methylene are, I think, as yet insufficient. As we have seen lately, one death has resulted from its use. In a case in which I administered it for a dental operation, signs of syncope occurred and I was obliged to substitute chloroform. The great question is does bichloride of methylene sustain the heart's action during profound anæsthesia with greater power than chloroform? To this question a wide practical experience (which, from *a priori* evidence, the agent greatly deserves) only can reply.

The agents which remain to be considered are ether and chloroform. Concerning the comparative action of these, I think we are justified in concluding that, while the latter is by far the more practicable agent, ether can induce a profound anæsthesia with less depression of the heart's action than chloroform. If complete muscular relaxation be required, as for the reduction of dislocation, etc., it is better to use ether.

For the great majority of cases the chief agent remains chloroform. The contra-indications to its use are the existence of prominent signs of fatty degeneration of the heart (valvular disease is no contra-indication), *delirium tremens*, and habitual intemperance. In the first of these conditions it will be a question whether any anæsthetic at all shall be administered. Argument may fairly urge that the shock of an operation will be a danger to the feeble heart. On the other hand, there is the undoubted fact that chloroform can induce

cardiac debility. The dictum that "a case for operation is a case for chloroform," can be at once set aside as a finality which would arrest all one's efforts to impart greater safety into the practice of anæsthesia. Fortunately we have a method of relieving which can, as M. Claude Bernard has shown, go hand in hand with the operation of a volatile anæsthetic—the subcutaneous injection of morphia. Supposing, therefore, a patient having undoubted signs of cardiac degeneration be the necessary subject of an operation, I think no better plan could be counselled than the subcutaneous injection of morphia, followed, if necessary, by the inhalation of ether. In cases where the patient is the subject of habitual intemperance, the subcutaneous injection of morphia also is indicated. With this preparation chloroform may with care be administered instead of ether, which has a longer stage of excitement. Having made choice of an anæsthetic, another rule presents itself to us.

*B.* Especial care should be taken at the early stages of the administration of an anæsthetic, whatever that anæsthetic may be.

There is no doubt that the emotional disturbances which occur at such a time may induce dangerous and even fatal effects. Sudden death at the moment of commencement of an operation when no anæsthetic whatever has been employed, are far from uncommon. Such instances have occurred in the practice of Stanley, Desault, Civiale, Roux, Chopart, Cazenave, Gargangeot, and others, and have been recorded by many observers. Giraldes goes so far as to say that "the accidents which have been observed do not much surpass in number the cases of sudden death which have occurred without apparent cause during or soon after operations." From collateral evidence, however, we know that this though a partial, is not a complete explanation of chloroform dangers. It is a significant fact that nearly half of the cases which have proved fatal (50 in 190) succumbed before the full effect of chloroform was induced. This leads to the consideration of a word, which I confess I do not like, that has been

adduced to explain the catastrophies—idiosyncrasy. What does it mean? A condition of system inimical to chloroform *qua* chloroform? It cannot be so, for we see that emotional syncope may occur without the anæsthetic element. Just as some people faint at slight causes—the scratch of a finger, the sight of blood, or an emotional effort—so some fatally faint at the commencement of an operation. Moreover, some of those who have suddenly died in the early stages of chloroform administration have previously inhaled with impunity. It follows that every effort should be made that the emotional disturbances should be calmed, and that the early stages of an administration should be conducted with care and caution. This eliminates one of the elements of the so-called idiosyncrasy inimical to chloroform; it is a condition of sympathetic susceptibility induced by any external agency. It will not, however, explain those deaths which occur in the more profound stages. we are led to a third rule—

C. In the administration of chloroform due regard should be paid to its well established physiological properties. This may almost seem a truism. Yet I think that nearly all who have made this subject a special study will agree with me that the toxic action of chloroform is ignored in the common method of administration. No one can from experiment or from observation of the records doubt for a moment that chloroform does not possess a toxic action; and just as with all other agents its danger is dependent upon its dose. The most competent authorities agree that too strong atmospheres of chloroform are dangerous. For the purpose of inducing and maintaining anæsthesia a portion of no more than four per cent. of chloroform vapour in atmospheric air is necessary; above six per cent. is dangerous. Strong atmospheres of chloroform administered to the human subject are dangerous in two ways—First, by their tendency, acting on the branches of the *parvagus* distributed to the lung, and thus by reflex action upon the heart, to cause shock or cardiac syncope.\* This may occur at the early stages of anæsthesia

\* On this point see an exhaustive review of the whole subject of anæsthesia in the *American Journal of the Medical Sciences* for January, 1867, and Brown Sequard's Lectures on the Physiology and Pathology of the Nervous system, p. 160,

or any period prior to complete loss of consciousness. secondly, by direct paralysis of the cardiac and vaso-motor nerves. This can occur only in profound anæsthesia, though it also may be rapidly induced. When pure chloroform is sprinkled upon a piece of lint or a napkin, what percentage of the vapour is it possible for a patient to inspire? I have been at some pains to investigate this, and it may cause some surprise to those who have not practically inquired into the point to be assured that it is possible for a patient at a temperature of from  $60^{\circ}$  to  $64^{\circ}$  Fahr., when a drachm of chloroform is sprinkled upon lint, to inspire an atmosphere containing more than thirteen per cent. of the vapour.†

Of course a happy chance so regulates the matter that a patient does not usually inhale this proportion, and a skilled administrator will take care that he does not; but the possibility of the danger remains. How often in the details of the fatal cases it is recorded in some such fashion as this, "More chloroform was poured upon the lint, the patient, inhaled and fell back, etc. etc." Why? because he suddenly inhaled a deadly dose.

Granted that a due dilution of chloroform is a necessary thing, how shall we obtain it? There is a widely spread objection against inhalers; they are not at hand at the moment they are wanted. I think they can be dispensed with if the chloroform employed be diluted with an equal bulk of absolute alcohol. By such a measure as this I have ascertained that, partly by the admixture of the chloroform vapour with the vapour of alcohol, but chiefly by the retarding power which the latter exerts upon the volatilization of the chloroform, the percentage in the resultant atmosphere is reduced just one half. The above consideration eliminates another element so-called idiosyncrasy. The effect of a sudden inspiration of a strong chloroform atmosphere is just as much toxic as the swallowing of an overdose of prussic

† See tables appended to my paper read at the British Medical Association at Oxford, and reprinted from *British Journal of Dental Science* for September, 1868, and "On the Parturition and Anæsthetics in Obstetric Practice" in *Transactions of Obstetrical Society of London*, vol. x. p. 161.

acid. But it may now be urged that in some cases wherein you have exercised all care, and while you are administering only a proper dose of chloroform vapour, from some cause (perhaps connected with the operation) the heart may show sign of failing. We are led to what I think may be established as a rule.

*D.* In the course of the induction or during the maintenance of anæsthesia one agent may be advantageously substituted for another. Practically, in animals, as well as in man I have found that if in the course of chloroform administration there has been the least sign of circulatory debility ether substituted for the chloroform renews the power whilst maintaining the anæsthesia.† This is confirmed by my friend Mr. Geo. Cowel, in a letter to these columns. In observations upon animals I have found that the substitution of any one anæsthetic for any other stimulates the heart.

*Practical Rules.*—Selection of cases having been made according to the principles before mentioned, I would suggest the following as rules for guidance:—

1. The administrator intrusted with the induction of anæsthesia should be provided with the following armamentarium: A case of three stoppered bottles, one containing the mixture of chloroform and absolute alcohol, another pure chloroform a third absolute ether. A soft handkerchief or porous material through the fibres of which, when covering the face, respiration can readily take place. A hypodermic syringe with suitable morphia solution.

2 The patient should have abstained from food as far as possible on the day of inhalation. Nothing whatever should have been taken for hours.

3. The patient being, if possible, in the recumbent position, the administrator should place the handkerchief over the nose and mouth, so as loosely to cover them with a single fold, and note that respiration is unimpeded. The mixture of chloroform and alcohol should then be dropped on the fold, a few minims at first, and, after two or three inspirations,

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† See Observations by Dr. Greenhalgh, *Obst. Trans.*, vol. viii. p. 53.

twenty or thirty, which should be renewed as often as evaporation renders necessary. This should be continued until the desired stage of anæsthesia is arrived at.

4. Ether may now be substituted if it is thought desirable the fold of lint being moistened therewith.

5. In some rare cases it may be necessary (but only after tolerance has been induced by the administration of the dilution) to use some of the pure chloroform.

6. In case of any alarming symptoms, artificial respiration should immediately be practised.—*London Med. Times and Gazette.*

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## ARTICLE VII.

### *Carbolic Acid as an Antiseptic and Prophylactic.*

It is now certain that these putrefying (septic) germs [animal and vegetable germs floating in the air] are great causes of putrefactive *fermentation*; that fermentation is intimately connected with *inflammation*; that most *diseases* result from inflammation; that carbolic acid (antiseptic) will kill all septic germs, and thus remove many *causes* of disease; that glycerine is a very powerful healing agent; that carbolic acid is freely *soluble* in glycerine; and that their *united* application has resulted in the speedy cure of some of the most dangerous diseases. It follows, therefore, that these new therapeutic agents demand special attention.

As a rule, it is better to dissolve the crystalized carbolic acid (Calvert's) in the proportions of one part by weight of the acid to six of glycerine (*carbolate of glycerine*). In this state it can be easily diluted to any degree of strength.

In general, a *dose* of carbolic acid is 1 grain in an ounce of water.

As a *gargle*, 1 or 2 grains to an ounce of water.

As an *injection*, 1 grain to 4 ounces of water.

As a *lotion*, 15 grains to an ounce of water.

As an *ointment*, 16 grains to an ounce of benzoated lard.

As a *liniment*, 1 part to 20 of olive oil.

As a *plaster*, 1 part of carbolic acid to 3 parts of shellac.

The crystalised carbolic acid to be used as a caustic.

The carbolate of glycerine, as above, use in 1 or 2 drop doses internally.

Antiseptic oil for abscesses, 1 part of acid to 4 of boiled linseed oil.

Antiseptic putty, 6 spoonfuls of the antiseptic oil mixed with whiting.

Aqueous solution of carbolic acid is 1 part of acid to 40 of water (1 ounce of acid to a quart of hot water well agitated and filtered.)

Sick-rooms, to disinfect: place a portion of the dissolved crystals in a porcelain dish, and float it in a larger vessel of hot water.

Disinfecting purposes generally: 1 pound of *crystals* to 6 gallons of water. *Fluid*, 1 part to 80 of water. *Powder*, 1 ounce of crystals with 4 pounds of slaked lime.

For drains: 1 pound of the fluid carbolic acid to 5 gallons of warm water.

Tooth-ache is often cured with 1 drop of carbolate of glycerine; and diarrhoea arrested in half an hour with 2 drops in a wine glass of water.

In all cases of parasitic life it is advisable to commence with very dilute carbolate of glycerine.

Inasmuch as carbolic acid will destroy the power of *vaccine virus*, it becomes an interesting inquiry as to the possibility of using carbolic acid internally as a preventive, so as to fortify the human system against the incoming of zymotic diseases.

I have some striking facts in support of this probability; but my observation has been too limited to do more than incline to the belief; and here I leave it in the hands of the Conference, expressing my readiness to give further details if the members desire it.—*London Pharmaceutical Journal. Medical Archives.*



## ARTICLE VIII.

*An Operation on the Lower Jaw.*

By C. F. MAUNDER,

Surgeon to the London Hospital.

From various causes, more or less of the lower jaw may demand removal, and one great aim on the part of the Surgeon should be to disfigure his patient as little as possible. Tumours of various kinds call for operative interference, and, if growing from the alveolus, can be easily cut away, leaving the line of the base of the jaw intact, and without any external wound of the cheek. So far as I am aware, it has been customary to incise the cheek more or less with a view to the removal of half the base of the jaw, for example, or for the removal of the ramus, so large an extent of jaw, as half the base not having been hitherto taken away through the mouth. In speaking of these operations on the jaw, I make a distinction between ablations of portions of jaw for tumour and the mere extraction of a sequestrum. In the former instance a careful dissection is necessary in order to separate the healthy attachments of muscles, while, in the latter case (necrosis), the bone is lying more or less loose, and requiring only a certain amount of pulling and twisting to get it out of its bed. I have assisted at the removal of the *whole* lower jaw, become necrosed in the person of a lucifer-match maker. The dead bone was cut in two at the symphysis, without section of integument, and then either half, having been seized with forceps, was twisted out of its place, and brought out through the mouth,

With a view to prevent deformity, and with a hope that some new bone may be developed, I have recently (March, 1870) removed a portion of the lower jaw comprised between the line of the right canine tooth and the middle of the left ramus, without wounding the cheek at all, and preserving a good share of the periosteum. The patient is a female 10 years of age, and the left base of the jaw was enlarged to the size of a hen's egg, the swelling projecting both outwards

and inwards to the floor of the mouth, displacing the tongue somewhat, and deforming the lower part of the face. The tumour had a history of two years, had enlarged a good deal of late, was painless, smooth on the surface, and hard and resistant to the touch. It gave one the impression that a growth within was expanding the jaw. I did not pretend to make a diagnosis beyond suggesting that it was probably benign, and that the first part of my operative procedure would be exploratory. I thought it possible that I might have to deal either with a cyst or with a fibrous or cartilaginous growth, and, if so, that I might be able to evacuate the one and enucleate the other, and at the same time preserve the line of the jaw unbroken; but in this I was disappointed.

*Operation.*—Chloroform having been administered, I drilled a hole into the tumour through the mucous membrane covering it, and proved it to be a soft solid within hard walls. I then broke down a portion of this wall with chisel and mallet, and having extracted a portion of the growth, handed it over to Messrs. Sutton and Tay for immediate examination with the microscope. They reported the growth to be myeloid in its nature, and I then proceeded to isolate the portion of bone involved in the disease. The integuments of the chin, including muscular attachments and periosteum, were first turned down off the symphysis, partly with a scalpel and partly with a raspator, so as to expose the right side of the jaw opposite the right canine tooth (which was then extracted by Mr. A. W. Barret) to the action of the saw and cutting forceps. The soft parts were protected from injury by a spatula passed up through the floor of the mouth behind the bone. The section here being completed, the gum and mucous membrane were severed down to the bone, and a raspator introduced separated the periosteum, and with it muscular attachments to the required extent, and now, the lower half of the left ramus being bared, this process of bone was cut across with forceps. While affecting this latter step, and using the bone as a lever to aid the appli-

cation of the forceps, the base broke in two, being now a mere shell of bone. The ramus also was splintered slightly by the forceps. One or two touches with the knife, and the now loosened bone was detached completely. Bleeding was trifling, no ligature being requisite. The muscles of the tongue had been severed at the back of the symphysis, and, to secure this organ forwards, the ligature, put through the tip for a similar purpose during the operation, was fastened to a hare-lip pin passed through the integument of the chin.

For several days subsequent to the operation the mouth was repeatedly syringed with Condy's fluid and water, and fluid nourishment was plentifully administered. The case has progressed favorably throughout, and, although three weeks only have elapsed since the operation, the patient can protrude the tongue, can articulate tolerably well, and has been running about during some days past.—*London Medical Times & Gazette.*

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#### ARTICLE IX.

##### *Amalgam for filling Carious Teeth.*

By W. GEO. BEERS, Dentist, Montreal;

Clinical Lecturer to Royal College of Dental Surgeons of Ontario; Honorary member of Ontario Dental Society; Secretary of Dental Association of Quebec, Corresponding Member of Odontographic Society of Pennsylvania; Editor of *Canada Journal of Dental Science*, &c.

In the January number of the *Canada Medical Journal* appears an article by Mr. Bowker, dentist, on the use of amalgam for filling carious teeth, which calls for some reply. The author "assumes to be the expositor of the abuses of dentistry," and has the modesty to intimate that he stands almost alone as a Canadian dentist who does not adhere to a practice which he calls "unskillful, ignorant and dishonest," and the assurance to identify with this practice our Canadian Dental College and Societies, and the private practice of almost all dentists in the Dominion. I do not remember an other instance in your Journal where a correspondent, discussing a scientific question, found it necessary to impute

inability, ignorance or dishonesty to all who were not of his opinion. I find no fault with Mr. Bowker for the facility with which he attempts to dispose of a question involving abstruse chemical, physiological and pathological causes and effects, and necessitating extensive research and experiment into the particular subject; but I cannot see the necessity for unjust accusations to give force to scientific argument. Especially when one essays to be a philanthropist, he should, at least condescend to be correct.

Mr. Bowker asserts that the "American Society of Dental Surgeons" *unanimously* carried a resolution (in 1845) condemnatory of amalgam. That is wrong. Sixty-one of the one hundred and thirty-three members voted against it, and *the resolution was finally rescinded by the very majority who framed it.*

Mr. Bowker says; "The institution *with the imposing title* of 'Royal College of Dental Surgeons' encourages the use of amalgam' and that the same may be said of the 'Dental Association of Quebec;' and "that the Dental Societies of Canada, who put themselves forward as the guardians and representatives of the profession in the Dominion, not only advocate but vindicate its use." It is not surprising that your correspondent is ignorant of what has or has not really transpired in our dental Societies, &c., as he is not a member of any; but as an illustration of the trouble he has taken to make himself acquainted with facts, I am qualified to assure you that neither college nor societies have once, directly, or indirectly, discussed the subject, and that all clinics in "filling teeth" have invariably been done with gold. The sneering allusion, *en passant*, to the College may pass for its full value, but I venture to say that the institution will survive any such disparagement. On its faculty it has some leading medical men of Ontario, such as Drs. Canniff, Sanger, Rolph, Bethune, Geike, Berryman, &c., as well as leading dentists of the upper Province, and, moreover, it, with the societies and the progressive movements generally of

the profession, have the hearty sympathy of all prominent medical men in Ontario.

Another assertion is that "the highest dental and medical authorities European and American, have condemned the use of amalgam, in any form whatever, for filling teeth, as malpractice." Now, we must expect differences of opinion upon this whole subject of amalgam ; but no reasonable man will say that opinions dictated when amalgams were composed of impure metals, and imperfectly understood, can continue to hold good against the superior improved article. The possibility of even a good amalgam being abused by the use of impure mercury, or "sixty-four parts of mercury to thirty six of silver," is no more reasonable argument against the use of this material, than an argument that no preparation of arsenic, morphia,, &c., should be used because they are infallible poisons. To-day there are some dental writers whose opinions of amalgam may be quoted as arguments against its use ; but Harris, Piggot and others wrote when amalgam was abused, and in the former work we find methods of "treatment" recommended for various dental diseases something analogous to amputating a finger for a wart. And it must be remembered that the names "Royal Mineral Succedaneum," &c., transcribed by Mr. Bowker, were only given to the old compounds many of which contained copper, lead, bismuth and other alloys, and that these old compounds were decidedly "condemned" by all intelligent dentists, and are to-day. But when the material was improved, and brought to the pureness of the amalgams of the present time, many of the very leaders who opposed "Royal Mineral Succedaneum" approved of and used the improved compound.

We might give up filling teeth altogether if we were to abstain from every material that may be "abused." A dentist whose gold fillings are soft as cheese a month after insertion gives us clear demonstration either of his "unskillfulness or ignorance, or want of honesty ;" and certainly any one who would put an amalgam into a tooth which had 64 parts of

mercury to 36 of silver would be deserving of some much stronger epithet than "dishonest." The use of filthy amalgam is paralleled, by the use of impure gold; slovenly manipulation with either material has the same results. Teeth are filled with gold and amalgam that should never be filled at all, but alveolar abscess resulting after the latter is traced by some to the material, when a worse case after the use of gold is diagnosed to causes distinct from it. There are certain conditions of dental caries where we can guarantee to produce periosteal disease by inserting a gold or any other filling; and amalgam, unfortunately for its reputation, is too often used as a *dernier resort* in teeth which should never be filled at all.

Before giving your readers brief extracts from the latest opinions of "high authorities" in Europe and America, I may venture to say, with the highest respect for the knowledge of those who are not dentists, and who have given opinions prejudicial to amalgam, that the opinions upon this subject of men of acknowledged ability and experience, who, besides being physicians and practical chemists, are eminent dentists, are worth something more upon the average, than the opinions of men who have not the same special life long experience with the pathology of the teeth. For over twenty-five years this subject has been before the dental profession; every day, we may say every hour fresh opportunities appear for investigation: and the opinions of such investigators as I will quote surely cannot be ignored.

No one in Europe has made more thorough and dispassionate investigations into this subject than the author of "Tomes' Dental Surgery," a name familiar to more than dentists. In the early editions of his "Surgery" he says he never saw a case of salivation, and did not believe there could be such a result from the use of amalgam. A few years ago he made more extensive researches, and reiterated his former conclusions more forcibly than ever. I might quote, *in extenso*, from English, German and French authors of the highest repute, who approve of and use amalgam. I

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am not disposed to believe that the State Dentists of Europe, and such men as Tomes, Naysmith, Saunders, &c., are prompted to use amalgam by any of the considerations Mr. Bowker assumes, viz.: "cheapness, want of skill, ignorance, or the want of honesty."

Nothing, however, more conclusively reveals the truth than the facts that, with some few exceptions, the American dentists, who so violently opposed amalgam in 1845-47, now use it. Some who even continue to condemn it, admit that they do so, because there is a danger of it being abused, while some few still maintain the same objections to the improved amalgam that they held towards "Royal Mineral Succedaneum." To-day you may go into dental offices in New York, and witness the operator filling teeth from a pot of amalgam, which is mixed and kept ready for use at all hours! (Sundays not excepted.) I presume the proportions are 64 parts of mercury to 36 of silver. Now because there is this abuse of the material, that is neither logical nor scientific argument against its proper use.

Dr. Pierce late Professor of Dental Physiology and Operative Dentistry in Pennsylvania Dental College, says; "Many attribute results to amalgam that are due to its improper use. That there are teeth that can be saved for a much longer period, and with greater advantage to the possessor with amalgam, than with foil, especially as some dentists insert foil, no unprejudiced practitioner can deny."

Dr. Buckingham. Dean and Professor of Chemistry in Pennsylvania College, says "he uses amalgam in his own practice, and thinks a dentist to do justice to his patients, should use it in certain cases. Had never seen a case of salivation from it, and had strong doubts of it ever producing ptyalism."

Dr. McQuillen, Dean and Professor of Physiology in Philadelphia Dental College, and editor of the well-known "Dental Cosmos," says "He had had strong objections to amalgam, and had opposed its use; but candor compelled him to say that his views had changed, and he does not now

regard it as the unquestionable cause of all the difficulties ascribed to it; for in an experience of fourteen years he could not recall a single instance of ptyalism &c., of which others asserted they had seen so many. He looked upon those who had asserted to have seen them, with considerable doubt as to the value of their judgement and opinions as reliable diagnosticians."

Dr. Fitch a leading physician and dentist of New York "pleaded guilty to the charge of early prejudice against amalgam. He was now, however, disposed to give it its appropriate place, even at the risk of encouraging empiricism and cheap dentistry. He had yet to see the first case of ptyalism from its use."

Dr. Flagg, Professor of Dental Pathology and Thera. in Philadelphia Dental College, and *the first man who wrote against amalgam in 1845*, says, "he is now entirely opposed to the statements made regarding the constitutional effects from amalgam fillings. He had again and again treated teeth suffering from periostitis, &c., attributed to amalgam, and had refilled them with amalgam, for the sole purpose of proving to his patients that the material used had nothing to do with the trouble existing."

Dr. Allen, formerly editor of the "Dental Record" has written folios to expose the fallacious arguments of the opponents of amalgam. He says: "I have seen over 1000 persons, each having from 1 to 10 amalgam fillings in their teeth, and I only saw one case of ptyalism, which I attributed to dead and ulcerated roots. As soon as the roots were removed the trouble gradually disappeared. I have been brought to see cases of supposed ptyalism from amalgam fillings and have found them to be nothing of the kind, but owing the origin of the disease to salivary calculus, ulcerated roots, sponginess of the gums, &c."

Dr. Garretson, author of a late work of 700 pages on "Diseases and Surgery of the mouth, &c," describes the mode of using amalgam for filling teeth, and totally ignores the charges made against it.



I might continue thus to quote from men whose ability to investigate, opportunities to examine, and integrity to report conscientiously, cannot for a moment be doubted. The opinions cited above are founded upon thorough experiment and extensive experience; their authors have their attention confined to the mouth, and the opinions of such men cannot be ignored. The February number of the "American Journal of Dental Science" contains a review of this very article of Mr. Bowkers, in which it says: We think Mr. Bowker has taken an extreme view of the case. *We think this compound may be used* in teeth which are mere shells so far gone that no other metal can be safely introduced. *When properly prepared and properly introduced*, instead of amalgam containing 64 parts of mercury to 36 of silver as Mr. Bowker asserts, the proportions of mercury need not and should not be half so great." It proceeds to give "*the best method for using this material.*" Is that a condemnation of amalgam?

I do not find one single argument in Mr. Bowker's paper that was not known and proclaimed a quarter of a century ago; the names he ascribes to it are a quarter of a century old, and posthumous; the proportions he gives are only those of the quacks, Crawcours, who introduced a filthy amalgam into American dentistry over 30 years ago, and who have been dead nearly twenty! Precisely the same arguments Mr. Bowker put forth may be found in the early volumes of American Dental Journals, and, strange to say, some parts of his paper are word for word, saving one or two alterations such as "teeth" for "mouth," &c., with an essay on amalgam by Dr. Geo Watt. (See Watt's Chemical Essays, page 149.)

The charge against amalgam of producing ptyalism is, I hold, mere assumption. The astute pathological knowledge of those who write against the material, is seldom capable of giving an opinion so precise upon any other disease in any other part; and their utter disregard of any other cause of salivation, when there is amalgam in the teeth, is very expeditious, if not very sound. We know that idiopathic

or spontaneous salivation may, and does arise where no mercury has been used; and that the same symptoms of swelling of the salivary glands, fetor, &c., may be present; and that certain preparations of gold, antimony, &c., will produce profuse salivation. Watson, in his *Practice of Physic* names castor-oil, digitalis, iodide of potassium, opium, pregnancy, &c., as possible causes of ptyalism; but the opponents of amalgam, if they find it in the teeth, at once pounce down upon that unhappy material as the sole and only cause. I should hardly venture to call that scientific.

The following concise opinion by a "high authority"—who is a physician, dentist and practical chemist—is preferable to words of my own. "Certain *preparations* of mercury, it is well known, produce, under certain circumstances, very powerful effects on the human frame; but in order to do so, it requires to undergo a change in its composition and character, which in the form in which we find it in amalgam, it never does nor can undergo. It needs a degree of oxydation or a minuteness of division which renders it useless for filling. The two characters are inconsistent with each other. If the quicksilver in the mixture undergoes such a change as to allow of its mercurializing the system, it will not answer as an ingredient in the filling, and *vice versa*. In the combinations it forms in this filling, and as long as it remains so combined, it cannot effect the system. Before the system can become subject to its mercurializing influence it must first become uncombined from the silver, which is impossible because of its stronger affinity for that metal than for oxygen; and secondly, must recombine with such a quantity of oxygen, as it cannot be made to unite with it in the mouth. Add to this, that the exposed surface of the filling itself must also have lost its cohesion; to have become quite soft; and to have very perceptibly diminished in quantity. But in the face of these impossible, yet absolutely necessary changes, we find amalgam fillings still solid and sound after being in the mouth ten and twenty years, and not a single symptom of mercurial action, local or general, upon the system!

With equal propriety it might be urged against gold, that because, when highly oxydized, it becomes a powerful medicinal agent, therefore it should not be used as a filling for teeth. The error of those opposed to amalgam proceeds from a want of discrimination between diseases totally different in their cause, character and consequences."

It is very strange and suggestive that out of the thousands of times and for many years in which amalgam has been used, and in many instances abused, that so few cases of local or constitutional disease arising from its use are heard of; and it must be remembered that, if such evil results ensued from amalgam, it is not likely they would entirely escape the observation of such intelligent and responsible men as those I have quoted. It is equally strange and suggestive that a case of such supposed disease was never met with by any but those who opposed amalgam; and that not a single new argument against its use has been adduced for a quarter of a century, while, on the other hand, the quality of the material has been vastly improved, and the importance of careful manipulation thoroughly understood.

In concluding this hasty review of Mr. Bowker's article, I trust I will not be misunderstood, and here, I think, I may venture to speak for a large majority of Canadian dentists who use amalgam. The proceedings of our Dental Societies will convince you that "gold" is acknowledged to be, by far, the best material for filling teeth for the large majority of cases; but there are circumstances and occasions when gold or tin foil cannot be used to the best advantage. Those who oppose amalgam admit this, and what do they use instead? Preparations of gutta-percha, "Osteoplastic" and other such soft fillings. The former will soften in hot water, and neither can preserve the teeth intact more than a few months. With the greatest care to use only the best amalgam, the purest mercury, to thoroughly remove every particle of decay from the tooth, and prepare it as carefully as if for gold, and see that the proportion of mercury is not 64 parts to 36 of silver, we hold that amalgam arrests decay, and

cannot cause either local or constitutional trouble of any kind. On the other hand, we freely acknowledge the possibility of injurious results from Mr. Bowker's proportion of 64 of mercury to 36 of silver, especially if the compound is old "Royal Mineral Succedaneum." Even the best amalgam has its place; it is kept there. Those who use it in the front teeth, and for small cavities anywhere, are quacks; but those whose *gold* fillings as soft as cheese a month after insertion are not much better.

I regret that Mr. Bowker's unusual style of discussing a scientific question has compelled me to skim over practical points; but his unjust accusations have gone to the public, and being unjust it is but right that they should be refuted. Such a modest syllogism as the following—which is simply reduced from his own words—cannot be permitted to pass without a censure, or at any rate, a joke.

Whoever uses amalgam is "unskilful, ignorant or dishonest."

The Canadian Dental College and Societies, and "almost all dentists in the Dominion use amalgam," and I do not.

Therefore, "almost all Dentists in the Dominion" are "unskilful, ignorant or dishonest," and I am not.—*Canadian Medical Journal*.

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## ARTICLE X.

### *Anæsthesia.*

By G. Q. COLTON.

I have perused, with much interest, the article "Anæsthesia in Surgery—Who discovered it?" published in the April number of the DENTAL REGISTER. I agree entirely with the writer that the honor of that discovery belongs alone to Dr. Horace Wells; but the article contains some errors, and omits some important facts connected with the subject, which I will briefly endeavor to correct.

At the close of the exhibition of the gas which I gave in Hartford, on the 10th of December, 1844, at which a young man (I think it was not Col. Cooley) bruised himself against

some benches, but experienced no pain. Dr. Wells asked me why a tooth could not be drawn with the gas without pain. I replied that the thought had never occurred to me. I then remembered and stated that at an exhibition which I gave at bridgeport, a few evenings previous, a young man broke one of the bones of his hand, but said he felt no pain till the effects of the gas had passed off. Dr. Wells at once decided to try the experiment on himself, and arranged with me to bring a bag of the gas to his office the next day. He had a molar tooth, slightly decayed, which he was willing to part with. Accordingly the next day I took a bag of the gas to Dr. Wells' office. Dr. Riggs was called in, when I administered the gas to Dr. Wells, and Dr. Riggs drew his tooth. The statement that "Dr. Wells took the pipe of the gas-bag in his mouth, and it was kept there till his hands fell lifeless and his head drooped," is slightly incorrect, as Dr. Wells did not touch the "pipe with his hands, neither did his hands fall lifeless or his head droop. I used but a small bag, such as would ordinarily produce exhilaration. On recovering, Dr. Wells exclaimed: "I did not feel it so much as the prick of a pin!" He would not have felt even this if his head had "drooped."

I think the statement about the consultation lasting till midnight, between Dr. Wells and Dr. Riggs, must be incorrect, for I saw nothing of Dr. Riggs that evening, and Dr. Wells walked home with his wife (according to her testimony) after the exhibition.

Dr. Wells was delighted with his discovery; and wished me to instruct him how to make the gas, and to furnish him with the apparatus. I gave him the instructions, but had no time to get up the apparatus.

Dr. Wells died in this city January 24th, 1848. Nearly two years of the time from the period of his discovery till his death, he spent in Europe in search of health. During nearly all these four years he was experimenting successfully with the nitrous oxide, using it constantly during his practice at Hartford. But with all his efforts, he failed to con-

vince the medical or Dental profession of the great value of the gas as an anæsthetic. With his death all use of the gas ceased, and even Dr. Riggs dropped it. It was condemned, passed out of the public mind, and was forgotten. In June, 1863, remembering the experiment with Wells, I determined to revive, and if possible demonstrate the value of this gas as an anæsthetic. I found it hard and up-hill work the first year, but the tide at length turned in its favor. While I claim no special merit for its revival, yet I think it should be remembered that the gas had passed out of public notice and laid dead for seventeen years, and *possibly* might never have been thought of again but for my efforts. So far as the public is concerned, the revival produced all the benefits of a new discovery. This belongs to Dr. Wells.

I had the pleasure of subscribing five hundred dollars towards securing the publication of the work on "Modern Anæsthesia," by the Hon. Truman Smith, and I believe it was the extensive circulation of this book in this country and in Europe which has carried the day in favor of Dr. Wells, as the original discoverer of anæsthesia.

The rather gazy advertisement which is copied from the *Hartford Times*, is, I presume, about what I should have written twenty-six years ago. But its puffy nature will be excused when it is remembered that it attracted the attendance of Dr. Wells, and was the occasion of the most important and valuable discovery of the present century.

I sincerely trust that the movement in favor of erecting a monument to the memory of Dr. Wells will result in triumphant consummation.—*Dental Register*.

## MONTHLY SUMMARY.

*Dyspepsia as a Cause of Consumption.*—It is a fact not generally known that dyspepsia is often followed by consumption, and that too, on well established physiological principles. Indeed, it hardly admits of question whether this is not the most fruitful source of phthisis, at the present day. Indigestion begets inanition, and this is but an incipient stage of the disease. A dislike

to fatty articles of diet is the most marked symptoms of this want of assimilation of this much-needed respiratory element. So marked is this physiological fact, that it might be safely predicated of a family in which one child distinguished itself from the others by its dislike of fats, that it will be more prone to become the victim of consumption than any of the others.

The dyspeptic may be known by his frequent complaints of "biliousness," acid eruptions after taking food, belching of wind, flatulence, heartburn, &c. Everything of a fatty nature seems to disagree with him, "raising acid," to use a popular phrase; sweetmeats, sugar, coffee, &c., causing uneasiness and a sense of weight in the stomach, owing to a want of power to digest them. Then follows emaciation, a disappearance of the adipose tissue by reabsorption into the circulating fluids of the body—for so long as the fires of life burn, they will consume the needed fuel. No readier method could be devised to cause consumption of lung substance, than to refuse to supply them with the carbon derived from fatty food; for the lungs as surely consume carbon as the locomotive engine. To withhold this is but to burn the incense so low as to consume the censer also.

The majority of cases of tuberculosis, whether hereditary or not, are preceded by well-marked dyspeptic symptoms. Indeed there is no reason why it may not be caused *de novo* by these derangements of the digestive organs, for the reasons stated above.

After the adipose tissue stored away in more healthful periods of life has been consumed, there comes a wasting of other tissues of the body, the muscles become flabby and shrink away, the skin becomes thin and transparent, showing the blue tracery of the vein beneath; at last, the lungs, robbed of fuel, burn out as truly oxydized as the fallen tree, over which the green moss has crept for years.—*Oregon Medical & Surgical Reporter*.

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*Prevention of Iron Rust.*—Dr. Calvert, a fortnight ago, communicated to the Chemical Society some very useful information on the rusting of iron. Rust is mainly sesquioxide of iron, and it has always been supposed that the active agents in producing it are moisture and oxygen. It seems however, from Dr. Calvert's experiments, that carbonic acid must be associated with these to



produce any considerable amount of oxidation. In dry oxygen, iron does not rust at all; in moist oxygen, but little and seldom; but in a mixture of moist carbonic acid and oxygen, iron and steel rust very rapidly. In like manner a piece of bright iron placed in water saturated with oxygen rusts very little; but if carbonic acid is present as well, oxidation goes on so fast that a dark precipitate is produced in a very short time. Curiously enough, bright iron placed in a solution of caustic or carbonated alkali does not rust at all. These facts show that the points to be attended to in the preservation of iron from rust are the exclusion of carbonic acid and moisture, two indications which may be very easily fulfilled.—*Druggist's Circular*.

*The Weight of the Brain.*—In the *Journal of Mental Science*, 1866, there is an elaborate paper by Dr. Shuman on the "Weight of the Human Brain," and he gives the following interesting table of the brain-weight of fifteen distinguished men.—

|                                               | Age. | Oz.   |
|-----------------------------------------------|------|-------|
| 1. Cuvier, naturalist . . . . .               | 63   | 64·5  |
| 2. Abercrombie, Physician . . . . .           | 64   | 63    |
| 3. Spurzheim, Physician . . . . .             | 56   | 55·06 |
| 4. Dirichlet, mathematician . . . . .         | 54   | 53·6  |
| 5. De Morny, statesman and courtier . . . . . | 50   | 53·6  |
| 6. Daniel Webster, statesman . . . . .        | 70   | 53·5  |
| 7. Campbell, Lord Chancellor . . . . .        | 80   | 53·5  |
| 8. Chalmers, celebrated preacher . . . . .    | 67   | 53    |
| 9. Fuchs, pathologist . . . . .               | 52   | 52·9  |
| 10. Gauss, mathematician . . . . .            | 78   | 52·6  |
| 11. Dupuytren, Surgeon . . . . .              | 58   | 50·7  |
| 12. Whewell, philosopher . . . . .            | 71   | 49    |
| 13. Hermann, philologist . . . . .            | 51   | 47·9  |
| 14. Tiedemann, physiologist . . . . .         | 80   | 44·2  |
| 15. Hausmann, mineralogist . . . . .          | 77   | 43·2  |

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Averages of ten distinguished men . 50-70 54·7

Averages of fifteen distinguished men . 50-80 52·7

The average brain weight, between the ages of 20 and 60, of Scotchmen is given by Dr. Peacock at 50 ounces, and from these figures it is evident that whilst Sir James Simpson's brain is much above the average of his countrymen, it is really lower than that of the brains of the ten distinguished men given in the preceding table who died between 50 and 70.



*Chloral Hydrate.*—This interesting drug has now been sufficiently tested by a large number of eminent practitioners to enable us to form a tolerably clear idea both of its merits and defects; and as we perceive that (after the usual fashion in matters medical) there is going to be an epidemic rage for the new remedy, it may be well to call the attention of the public to the principle features of its action which can be said to be fairly made out.

In the first place, the term "anæsthetic" should no longer be applied to chloral, for it has entirely failed to make good its claim to this reputation; even the largest doses do but produce a heavy and prolonged sleep, which is, however, essentially different from true anæsthesia. On the other hand, as a producer of sleep, chloral is, in many respects, unrivalled: for though, like every other remedy, it fails in a considerable number of cases, it does succeed in a very large number; in fact, it is inferior in certainty, as a hypnotic, to opium, and almost every other drug, in the character of its sleep producing action; there are no attendant symptoms of cerebral oppression; the sleep, though often prolonged, is light and refreshing, and no unpleasant after-symptoms are experienced. It is important to observe however, that this description only applies to the use of moderate quantities, and that not only unpleasant, but dangerous symptoms have been produced by doses which we regret to see are very commonly used. Very careful inquiry leads us to assert that it is both unnecessary and dangerous to give larger doses than twenty to thirty grains repeated once or twice if necessary, for hypnotic purposes. Doubtless it might happen that one hundred consecutive patients might take much larger doses with impunity, but the one hundred and first might present the alarming symptoms described by Dr. Reynolds in a recent number of the *Practitioner*, as produced by a dose of fifty grains, and these symptoms might easily take a fatal turn.

As a remedy for pain, chloral holds a very varying place in the estimation of medical men, some rating it highly, and others thinking it almost worthless. Perhaps the safest estimate of its power over pain is that it only exerts an indirect influence, by inducing a disposition to sleep, in which the pain is forgotten. Certainly it has entirely failed, in the hands of the present writer,

to relieve pain of a pure neuralgic type. On the other hand, there is a great deal of evidence that it relieves suffering where the parts are very *tense*, and where mere arterial *throbbing* counts for much in the production of the pain; thus it has been very favorably spoken of for its effects in gout. And this fact, if it be correct, corresponds with certain observations which have been made as to its action on the circulation. Both from sphygmographic experiments on healthy persons and on patients, and also from the details of the nearly fatal case reported by Dr. Reynolds, there is reason to that chloral exerts a contracting influence upon the arterioles, powerful in proportion to the dose; and it may well be that arterial throbbing is checked by this kind of influence.

On the whole, however, there can be little doubt that the great function of chloral is that of a hypnotic, and calmer of general nervous irritability. In delirium tremens it is excellent; and it is probable that with two such weapons for choice as bromide of potassium and chloral we shall be able almost entirely to dispense with the use of opium, which is so uncertain and dangerous a remedy in that disease. In the state of sleeplessness which threatens the access of puerperal mania, chloral is probably an unequalled remedy. In melancholia, its action as an hypnotic appears to be powerful and remarkably sure. In mania, also, it acts well enough as an hypnotic, though there seems some division of opinion as to whether it does permanent good. We may also state that in the irritable condition of aged persons, who find it difficult to sleep for any length of time continuously, the use of a single dose of thirty grains of chloral appears often to answer excellently well. The minor uses of the drug in relieving more trivial conditions of nervous irritation, and in alleviating painful spasmodic symptoms of various kinds, are probably considerable.—*Lancet*.

*Inebriation Hereditary*.—Dr. Turner, in his "Second Annual Report of the State Inebriate Asylum," states that out of 1406 cases of delirium tremens which have come under his observation, 980 had an inebriate parent or grandparent, or both. He believes if the history of each patient's ancestors were known, it would be found that 8 out of 10 of them were free users of alcoholic drinks.—*Med. Record*.

*Somnambulism.*—The Archbishop of Bordeaux thus describes a case of somnambulism in a young priest:—He was in the habit of writing sermons when asleep, and although a card was placed between his eyes and the note book, he continued to write vigorously. After he had written a page requiring correction, a piece of blank paper of the exact size was substituted for his own manuscript, and on that he made the corrections in the precise position they would have occupied on the original page. A very astonishing part of this is that which relates to his writing matter in his sleeping state, which it is said he did with perfect precision. He asked for certain things, and saw and heard such things as bore directly upon the subject of his thoughts. He detected deceit when water was given to him in the place of brandy which he asked for. Finally he knew nothing of all that had transpired when he awoke, but in his next paroxysm he remembered everything accurately—and so lived a sort of double life, a phenomenon which is said to be universal in all the cases of exalted somnambulism.—*Scientific Press.*

*Iodine Gargle.*—M. Cullier (*Union Medicale*) advocates the following in syphilitic ulceration of the mouth and throat, and œzema: Iodide potassium 1 part, honey syrup 30, and decoction of barley 120 parts.—*Journal of Materia Medica.*

## EDITORIAL DEPARTMENT.

*Rules of Hygiene.*—Dr. Geo. H. Napheys, author of "Modern Therapeutics," who is now in England, sends the following "Rules of Hygiene" in a letter to the *Medical and Surgical Reporter*. These rules are disposed along the walls and columns of the Free Public Library and Reading Room, having been compiled by seven prominent medical men connected with the principal hospital in London and Liverpool.

I. Wash the whole body, once at least in every forty-eight hours, either with cold or slightly warmed water, and rub thoroughly dry with a rough towel.

II. Eat your food *slowly* and chew it well, and sit still at least ten minutes after every meal; so may you hope to preserve both your teeth and your digestion. Beware of drinking any *very* fluids; tea and coffee should stand till tolerably cool. After fatigue and long fasts hot fluids, only not *too* hot, are valuable.

and a few mouthfuls taken in such cases, before beginning to eat are very proper, especially for elderly people.

III. Turn all your clothes (particularly those which you wear next to your skin) inside out before you go to bed, and hang them up to air above the level of your head.

If possible have two suits of clothes, and wear them on alternate days, folding up carefully those not in use after they are aired.

IV. Be sure to secure fresh air in your bedroom during the night.

V. If you have no ventilator in the window, or ceiling, or roof, or over the door, then leave the window from half an inch to two or three inches open during the night. Of course take care that there be no strong draft blowing in upon you during the night; but any thing is better than converting your bedroom into a black hole of Calcutta. Boring four or five tolerably large holes, an inch or so in diameter, through the *bottom* of your bedroom door will go a long way towards keeping the atmosphere sweet during the night. If you can, provide some means of escape for the foul air by a small aperture through the ceiling.

VI. Eschew, if you care for your teeth, all sweets, tarts, pastry, and confectionary, and also much sugar.

VII. Never sit down to breakfast without first going out into the open air for at least *three* or *four* minutes. Make your walks longer or shorter, according to your health and strength.

VIII. Open your bed entirely, lifting the sheet and blanket on which you have been lying, so as to let the air get underneath; and leave the window open, top and bottom, when you quit your bedroom in the morning.

IX. Do not eat more than *four* good meals a day; the chances are that you will find your appetite and digestion benefited by taking only three, and, perhaps even only two, hearty meals a day. Most especially avoid eating and drinking between meals.

X. Do not miss any chance of learning to *ride*, to *swim*, to *fence*, to *play single stick*, to *play cricket*, and *foot-ball*, to *row*, and to *spar*.

XI. Get, if you can, a plunge bath (a cold saltwater bath is best), the first thing in the morning, twice or thrice a week.

XII. Do not plaster down your hair with hog's lard, falsely called "pomatum," "pomade," or "bear's grease;" the hair is meant to assist in carrying off perspiration, and should not be clogged with grease. No appreciable mischief results from *oil*ing the hair, if you like to do so; nor does sweet oil do any harm to any part of the body, if you like to use it, by rubbing it into the skin before a fire, but on the contrary good, as it renders the limbs supple and more capable of strong muscular exertion.

Animal oils are better and less drying than vegetable ones, such as olive oil and cocoanut oil, for either skin or hair, and perhaps marrow oil is the best of all. The best sweet salad oil does harm to any part of the body, but, on the contrary, good.

XIII. Brush your teeth the last thing every night before going to bed, and comb and brush your hair the wrong way, so as to let the air in upon your head.

Rinse out the mouth after every meal.

XIV. If you have a flesh brush, use it once a day. The best time is at night. If not, polish your skin with a rough towel before you go to bed.

XV. If you dine out, avoid drinking more than one kind of wine; as a rule, after dinner, drink no wine, but take instead half an hour afterwards, a cup of good strong black coffee without milk or sugar, except, perhaps, with the smallest bit of toast last. Take nothing after this the same night, if it be a late dinner you have had.

It is best neither to take your "café noir" (small cup of black coffee) nor to smoke tobacco till at least half an hour after meals.

XVI. If you are troubled with cold feet at night, use plenty of friction (or rubbing), before getting into bed; and if that does not answer, then sponge them with cold water, and, when drying them, rub the toes and ankles upward, and not downward. In case this plan fails, as it does sometimes, and the feet remain still deadly cold, then try putting them in a mustard foot-bath before stepping into bed, and put on a pair of thick dry woolen socks directly afterward. The socks can be removed as soon as the feet are warm.

XVII. If you are troubled with costiveness or constipation, try taking the best Scotch oatmeal porridge (only let it be long and thoroughly boiled), every other morning for breakfast. Use salt and milk, according to taste, and take it, either with or without the addition of treacle, as you find it best agrees with you. Eat brown bread (that is, bread made of whole ground wheat) and butter.

A glass of cold fresh water taken when you first get out of bed, followed by a run or walk before breakfast, has often an excellent effect in removing heartburn, and in moving the bowels gently, particularly when at sea. Costiveness is a common complaint of landmen during a sea voyage, and a glass of cold water taken then, an hour before breakfast, frequently saves resorting to the ship's medicine chest.

XVIII. Eschew all hot and heavy suppers, unless you wish for an attack of nightmare, and avoid all suppers, as a rule, unless dinner has been taken early. A so-called "severe tea" late at night, is usually unwholesome. Never go to bed, if you can help it, with an entirely "empty stomach." This is often

cause of "insomnia" or sleeplessness, especially in elderly persons. By an "empty stomach" I mean, when a fast of five or six hours has been observed, and the last meal was not a substantial one. A tablespoonful of Hollands, or so, in half a tumbler of cold water, is very excellent for old people at bed-time, and some plain unleavened biscuit may be eaten at the same time. If you are troubled with a so-called "sour stomach," or heartburn at bed-time, or are in the habit of grinding your teeth when asleep, try eating a bit of stewed French apple (sold at the grocers under the name of "dried Normandy pippins") just before going to bed, or a stewed prune. Do not get in the habit of taking carbonate of soda in water, for heartburn; for its constant use may prove very injurious to the stomach.

XIX. If you have any one ill with fever, or any infectious disease in the house, do not visit him the first thing in the morning, on an empty stomach; but take a mouthful of good coffee or tea and a crust of bread before entering his bed room.

XX. If you are troubled with sleeplessness, rise early and get a good walk, or better still, a good ride, if you can afford to keep a horse, before breakfast; sponge the whole body before going to bed, and rub dry with a Turkish towel; use the dumb bells or any other gymnastic exercise, and jump into bed warm, and banish unpleasant thoughts. Do not smoke strong tobacco the last thing at night and adopt a warm, red flannel shirt, instead of a cold cotton or linnen one.

XXI. Look sharp after all drains, middens, privies and cesspools, connected with your house, if you wish to keep out infection, or any low fever of the typhoid class. Take care to keep them in good repair and working order, and flush all sewers and drains now and then with oceans of water. In a dry season pour a pailful or two of water, with about a quarter of a pint of carbolic acid (sold at all chemists as a disinfectant) in it, into all your drains, and cesspools, and middens, every other day, at least, to take away any bad smell. If you cannot get carbolic acid, use chloride of lime, Burnett's disinfecting fluid, or something of the same sort. Any way, get rid of foul smells in your house somehow. To purify a room pour a wine-glass or so full of vinegar on a pan of red-hot cinders, and let the vapor from it fill the room; then open windows and door. As a rule fill your washhand basin with water *over night*, against next morning and do not neglect at all times to put half a pint, or so, of water into each chamber utensil, or night stool, in a bed-room. You cannot be too cleanly or airy in a bed-room; banish all carpets, and see that no dirty clothes are left under the bed, and no slop left unemptied. Keep all dirty clothes' bags anywhere you like, only *not* in a bed-room.

XXII. *How to wash yourself in the morning.*—Fill your basin

over night, and, unless you take a plunge-bath or shower-bath, as soon as you rise, commence by putting your face deep into the basin; open and shut your eyes two or three times, looking at the bottom of the basin. Take your sponge full of water, and sponge neck and back of the head thoroughly.

I advocate washing the whole head with water. Then turn the whole head on one side, in turns, *and fill each ear with cold water*, shake the head, and the water will run out.

Others, medical men of great experience in aural surgery, say, "*do not pour water* either cold or lukewarm, *habitually* into the ears; the hearing may be impaired by the practice, as the tympanic membrane is most delicate. the wet end of a towel or silk handkerchief is all that is sufficient." For my own part, I prefer immersing the whole head, while washing and letting water run into both ears, while the head is in the basin or else, after washing or sponging the face and eyes, if the basin be not big enough and deep enough to admit the whole head beneath water, then by turning the head first on one side, and then on the other in the basin, to admit the water in the ears, which comes to much the same thing; but it is not quite so refreshing.

Then sponge the chest and small of the back, and underneath the arm pits; this is the least you ought to do. (I advocate sponging the whole body, and that both night *and* morning.) The least you can do with any attention to cleanliness or health, is to sponge the face, chest and back with water, and dry-rub the rest of the body, every morning, if not evening. Eschew the ridiculous practice of standing half naked, soaking and washing your hands for half an hour, the sole notion a boy has of washing himself. If you use a tooth brush night and morning, as you should do, it cannot be too soft. Hard brushes make the gums flee from the teeth, and produces premature decay, by causing the soft bone of the tooth to be exposed to the air, beyond the part of the tooth protected by the enamel.

For a thorough wash of the hands, use warm water; let it be rain, not hard or spring water; and before you begin soaping them, steep them well in the water for a minute or two, rubbing them the while, till the water has penetrated well into the pores; then use soap and a nail brush *ad libitum*. And by holding your hands under a tap, if you have one, of cold water, and "give them a shower bath," so to say; it is very refreshing and strengthening to the fingers. If you have no tap, just dip them into cold water, and rub them dry as quick as you can. Miss Nightingale, in her most useful "Notes upon nursing," recommends as even more effectual, holding them for a few minutes over a jug of hot water, so as to let the steam thoroughly penetrate the seams and pores of the skin, before commencing to soap them. But this requires time.



THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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VOL. IV. THIRD SERIES—SEPTEMBER, 1870. No. 5.

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ARTICLE I.

*Microscopy of a Deciduous Tooth.  
Ossified Pulp.*

By Prof. S. P. CUTLER, M.D. D.D.S.

A few days since I extracted a lower cuspid tooth for a girl about 13 years old, about one third of the fang absorbed away, the permanent successor coming up rather on the inside, tooth quite firm, not decayed at all, was not painful, had caused no trouble.

The end of the absorbed fang presented the usual appearance only a little inflamed. I put it into alcohol as usual when I wish to prepare specimens of pulp.

On cracking it in a vice, though not my usual custom, I found it solid and difficult to crush. On examination of the tooth to my great surprise I found no nerve canal as usual, instead quite solid bone; in more definite language the nerve cavity was completely ossified to the end of fang, presenting under the microscope the appearance of an ossified permanent tooth. The ossification was complete except a very small spot in the centre containing no soft portion of pulp, as might have been anticipated, only at end of fang where there was the remains of a portion of soft pulp though I could not find any signs of it in the tooth.



The line of union throughout between primary and secondary was perfect, there being no point of separation even from the effects of partial crushing in the vice, or shrinkage after drying, which is sometimes the case in similar specimens. This secondary formation was more chalky in appearance than usual, not the peculiar transparency characteristic of such secondary dentine in general.

This was not a case of nodular pulp, neither was it a case of *exo dentasis internus*, or gradual occlusion, as occurs from wearing away of crown by mastication or by old age; but a case different from either, a case of complete ossification of pulp with perfect union to interior pulp walls extending to end of absorbed fang. Such extensive ossification of pulp seldom occurs, only in extreme old age, or in cases where there has been extensive absorption of alveolus and irritation as may sometimes be seen. The cause of this unusual formation must have been the slight irritation caused by the developemental encroachment of the future successor and the fine attachments of the deciduous; though this latter is a common occurrence, witnessed daily by dentists, and nothing unusual.

There must be some peculiarity of temperament in this case not readily understood. My attention was not called to this subject at the time of extraction. It is a question how much farther fang absorption would have extended had the tooth been left to nature's processes; if any farther at all the process must have been much retarded as a double barrier would have been presented. The opposite tooth was also extracted and presented about the same appearance but was not examined, this tooth might or might not have been in a similar condition; I regret exceedingly I did not save that tooth for examination also.

Hardened or nodular pulps are a very common occurrence in all classes of teeth, resulting from decays or injuries. This variety of secondary dentine is often met with in young subjects when decays progress rapidly, and is not uncommon in old age. We sometimes notice nodulis in deciduous teeth though not so common.

The most extraordinary feature in this case is the peculiarity of the secondary formation; instead of secondary dentine, as usual, there was only a portion of the pulp presenting the usual appearance it being that of the crown which shows the fibrillar structure, together with almost true or normal lacunæ and canaliculi, only less clearly marked, some of them being very large and irregular in shape, appearing as dark bodies not transmitting as much light as true bone, more corpuscles, others and the most numerous portion nearly resemble true bone, more especially in the fang portion where the fibrillar arrangement is almost entirely wanting, and more completely so near the end of fang.

In the fang portion the differentiation of soft pulp into true bone corpuscles is quite complete, the fibrils mainly transformed. In some portions of the crown cavity the continuations of dentinal tubuli into the secondary formation is quite distinct, as in cases of permanent teeth in other portions quite indistinct and obliterated. I have never yet seen a case of nodular dentine or secondary dentine containing true bone structure before this one, and I had entertained the idea from numerous observations that such could not or did not occur, but now I have facts to the contrary in this single case. Now the difficulty in accounting for the transformation appears to be almost unaccountable. I will endeavor to give a solution of the problem: In the formation of either primary or secondary bone, there has to be provided a true bone matrix or cartillage, with always true cartillage corpuscles or cells in all primary bone cartillage not always necessarily the case in secondary, especially in the repair of fractures where adjustment had been perfect.

Bone is a very low order of vitalized structure, the teeth on the contrary very high in some respects especially that of sensibility; even the cement also, that tissue being a sort of hybrid of bone and dentine possessing attributes of both.

In order to have true bone there must be a bone matrix improvised in some way, otherwise bone could not be formed when bone cartillage transformation takes place, the original

cartillage structure entirely disappears no trace or vestige remains, the change being very striking. There is no apparent communication from one cartillage cell to another, only a homogeneous structure, In bone there are communications by canaliculi from lacunæ to lacunæ, the lacunæ probably occupying the original site of the cartillage cells, and the canals formed during differentiation are the connective canaliculi.

We find in the tooth pulp the elements of dental transformation by infiltration of lime salts into pulp structure, solidifying all but nerve fibrils which, from their actual resistance, reject lime encroachments so long as their neural connection remains intact. But should this connection be cut off in any way, then even the fibrils themselves might undergo this transformation, never without.

In the case above named we find portions where the fibrillar arrangements remains intact, especially in the crown where we may imagine the process to have commenced and before the fang absorption had progressed, for afterwards we may suppose the fibrils to have been more or less completely cut off by absorption at the point of contact with permanent encroacher and at the same time the blood vessels remaining more or less intact carrying lime salts into the partially now resistant pulp ending as the process advanced into some true bone formation. There are appearances of Haversian rods in several places, though not well established by characteristic concentric layers, as in true bone we could not expect this in such cases. We do not find any structure in the soft pulp resembling bone or any other cartillage structure, instead we find the neural fibrillar structure, also blood vessels and a cell structure fill with some oliaginous matters of a volatile nature, probably phosphated fat, though this fact has not yet been fully determined by chemical analysis. The pulp cells and even blood vessels suffer differentiation from soft pulp into secondary dentine, by replacement of the cell contents by lime salts, the cell structure remaining intact though not recognisable clearly under

the microscope, the fibrils occupying the secondary tubuli, and thus formed retaining to a greater or lesser degree their normal sentient vitality sometime giving trouble from their sensibility by extent of occupancy by earthy salts, their tubular extent being in such cases abnormal or more extensive the fibrils having an abnormal extent of bone structure, hence abnormal resistance to overcome, in consequence producing disturbance and pain, the result from irregular neural transmission of nerve force to the brain.

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## ARTICLE II.

### *Proceedings of the American Dental Association.*

The tenth annual meeting of the American Dental Association convened in the hall of the House of Representatives, at Nashville, Tennessee, on Tuesday August 2, 1870

At 10 A. M., the President, Prof. Homer Judd, of St. Louis, called the body to order, and the session was opened with prayer by Rev. T. O. Summers, D. D.

Dr. W. H. Morgan, of Tennessee, the Chairman of the Committee of Arrangements, then welcomed the association in a pleasing address.

Prof. C. K. Winston, M. D., by authority of the faculty of the University and the medical profession of Nashville, delivered an eloquent speech of welcome. He praised the perfection to which the art and science of dentistry had been brought, and he was proud to claim full kinship with them as professional brethren.

Dr. C. P. Baird, President of the Tennessee State Dental Association, delivered an address in behalf of that body.

The roll was then called, and over sixty members were found to be in attendance.

On motion of Dr. E. A. Bogue, of New York City, the reading of the minutes was dispensed with.

It was resolved, on motion of Prof. L. D. Sheppard, of Boston, that all resident dentists, physicians, lawyers, and clergymen be invited to take seats at the meeting.

The members of the Committee on Prize Essays were all absent, and on motion, the chair appointed Prof. J. Taft, of Cincinnati, Ohio, Drs. W. O. Kulp, of Muscatine, Iowa, D. S. Dickerman, of Boston, Mass. and J. R. Walker, of New Orleans, La.

The Committee on Dental Physiology were also absent, and Prof. S. P. Cutler, of New Orleans, La., Drs. George H. Cushing and J. N. Crouse, of Chicago, Ill., were appointed.

Of the Committee on Voluntary Essays, Dr. C. D. Cook, of Brooklyn N. Y. being present, became chairman. Drs. S. H. McCall, of Binghamton, N. Y., and J. Fouche, of Knoxville, Tenn., were added.

Dr. H. E. Peebles of St. Louis, Mo., moved that a committee of three be appointed to collect information of the whereabouts of the bound volumes of the Transactions, from the several committees having them in charge, and report to the association upon the propriety and practicability of disposing of them to persons not members.

Profs. Sheppard, Taft, and Dr. M. S. Dean, of Chicago, Ill., were appointed by the chair.

Dr. Bogue moved to adopt informally the printed programme furnished by the committee of arrangements. Carried.

Drs. Walker, A. C. Ford of Atlanta, Ga., and Peebles were appointed the Committee on Dental Instruments and Appliances

The reports of the committees not being ready, a motion to adjourn was carried at 11.05 A. M.

*FIRST DAY.—Afternoon Session.*

Called to order at 3 P. M.

After the reading of the minutes, the Committee of arrangements reported the credentials of the members correct. Adopted.

Prof. W. H. Atkinson, of New York, read the report of the Committee on Dental Pathology and Surgery.

Other written communications on this subject were called.

Dr. McCall, of the Committee on Voluntary Essays, reported that he had a paper to read, but that it was not written by a member of this association.

A motion was made and carried that it be read.

Dr. Morgan moved a reconsideration of the vote, as he thought it would be a bad precedent to allow parties not members to occupy the time of the association.

Prof. Atkinson hoped the society would hear the paper.

Dr. Crouse opposed it, as quacks could thus thrust themselves into notice and have worthless matter read.

Dr. S. J. Cobb, of Nashville thought the danger magnified.

Prof. Bogue favored the reading, and did not approve of exclusion.

Prof. Sheppard thought the writer of the article had the dental journals and local societies to offer the communication to, but that there are too many who do not take interest enough in either to support them.

Prof. Stellwagen said he came here to learn, and he cared not from what source his fund of knowledge was increased, provided it was truth; he could not suppose it would injure any one. What are committees for, if not to be the judges of the propriety of bringing papers offered to them before this body? If the three gentlemen who composed the committee had read the paper and felt that it was worth repeating, he could not do less than listen. He knew the writer, and believed he was connected with a local society, and was, if he is not now, an emeritus professor in a dental college.

Prof. Taft, of Cincinnati and Dr. W. W. Allport of Chicago followed in opposition to it as a precedent. The debate was closed, and the original motion lost.

Prof. Atkinson then proceeded with remarks upon pathology. He had felt impressed with the utter want of certainty as to what is health and what is disease.

By means of a diagram of the universe, he attempted to show how, as matter advanced in the scale, it took up new attributes, and how, with animals, their different senses gave different functions and capabilities of enjoyment.

He proposed the use of diluted sulphuric acid, one or more drops to thirty of water, for treatment of caries of bone, applying it carefully upon a thread of lint wound round an instrument or wire, and passed into the fistulæ, which might be enlarged by plugging with tents, and allowing the moisture to swell the plug and thus make an opening even large enough to look into the bone or pass a finger in. He claimed that the action of acid dissolved the mineral portion of the diseased bone, aiding its removal by washing, and yet that it would not injure, but rather stimulate the healthy structure to throw out granulations.

Prof. Cutler proposed to follow Prof. Atkinson. Phosphate of lime is a tribasic salt. We have been told that sulphuric acid, hydrochloric acid, etc. form a solution. But this acid takes out one equivalent of the lime, and it becomes an acid salt superphosphate. Hydrochloric acid produces a soluble salt, so does vinegar, etc.; but the sulphuric acid makes a comparatively insoluble salt. When chloride of zinc is brought in contact with lime, the zinc is turned loose as oxide, and the chlorine takes up the atom calcium, forming chloride of calcium.

Necrosis, he said, meant dead bone. Bone is the lowest tissue in the scale of life, except the teeth, and they are between the animal and crystalline, particularly the enamel; they are endowed with the most sensitive nerves, not excepting the eye or ear. If the dentinal tubuli project into the enamel, the substance is very sensitive.

Adjourned.

#### SECOND DAY.—*Morning Session.*

Meeting called to order at 10 A. M.; seventy members present.

Prayer was made by Rev. Dr. Young.

Reading of minutes postponed until the afternoon.

The resignation of Dr. George Watt, of Cincinnati, was read and accepted.

The following resolutions, by Dr. Peebles were adopted.

*Whereas*, It is patent to our profession that great ignor-

ance obtains among American mothers regarding the eruption and development of the teeth of their children; and *whereas*, such ignorance is one of the main causes of the loss of many teeth, and especially so of the six year old molars; and, *whereas*, to remedy this great evil will require a thorough and early course of rudimental instruction; therefore

*Resolved*, That a committee of three be appointed by the chair, whose duty it shall be to correspond with the publishers of American school books, and ascertain if some plan can be devised to have short, plain statements inserted of the number, name, form, and arrangement of the several teeth in the deciduous and also in the permanent set.

*Resolved*, That the committee be and is hereby authorised to make all the necessary arrangements with the said publishers of school books to carry out fully the ideas embraced in the preamble and first resolution, and report at the next meeting of this association.

Drs. Peebles, Fouche, and S. W. Dennis of San Francisco, were appointed as a committee for the carrying out of the resolution. Drs. Kulp and Cobb were added to the committee.

The discussion of "Pathology" was declared in order, and Prof. Cutler continued his remarks of the previous evening.

He said it had been stated that necrosed alveolus could be restored; he thought, if done, it was an exception to the general law of nature. He then described the condition of the tooth, and the relations between it and alveolus by peridentium or pericementum, when this membrane is left bare or denuded by violence, action of arsenic, or cobalt, or any cause. The cementum is like true bone, having all the characteristics; but he would call it super-bone, having more than a bone, for passing through it are the minute fibrillæ from the nerve pulp of the tooth. When denuded, it is extremely sensitive to any foreign body; but bone is not; even in amputation, the pain is only when cutting through the marrow. Now, when exposed, the nerve fibrils of the cementum give extreme pain, and the condition is one of hyperæsthesia. Even when denuded and dry, this is the case. To furnish a new matrix and restore bone will take two years; but we cannot restore the membrane of the tooth upon which to build, or with which the periosteum of the bone unites; no



provision has been made by nature; the dentine has no vascular system. When roots of teeth are united, it is always by the cementum. The alveolus in a case he recently had was dead, dry, and necrosed; he broke it out, and the pericementum was dead; but nature had made no attempt to reproduce this pericementum. There is consequently no means of attaching the pericementum to the cement of the tooth. In the tooth we have a neural system projecting beyond the hæmal; the nutrition is extravascular, as throughout the body. Bone is the only tissue that is reproduced; but others, when separated, are united by connective tissue, as cicatrix in muscle. At the point of a fang we may have an abscess, which may be cured and the space filled by cartilage.

Dr. Walker. All are familiar with the fact of the reformation of the alveolar process where extraction has taken place. Why should we not have the same where the tooth remains.

Prof. Judd arose to take exceptions to some of the points of the last speaker. He would do this to guard from assumptions in the study of the laws of life unless proven by actual facts.

The periosteum, the gentleman claimed, was destroyed; he did not know of any experiments or physiological laws that would demonstrate this periosteum to be dead. Logical deductions lead often to monstrous conclusions. The basis of periosteal structure and pericementum is the same. Beale traces one running into the other. Where there is periosteum, we have the elements to produce new bone, and even the marrow will make periosteum. These facts have been actually demonstrated, and he could not see why it should not be so with pericementum. In the Odontological Society, we have the fact reported that teeth had been extracted, periosteum scraped off, then replaced, and growing fast and firm. After experiments upon producing bone to fill up cleft palate, by dissection of the periosteum, and bringing these flaps together, bone has been found to form under the cicatrix.

Prot. Cutler explained that he had fallen back upon facts, and he had never seen or heard of a case where the pericementum had been reproduced.

Dr. J. G. Willis called attention to the remark that foreign substances could only be gotten rid of by expulsion or encysting. Recently experiments have been made that prove that necrosed bone may be removed from its position without ulceration. The extravasation of blood in brain, or a musket-ball projected into muscle, are familiar instances of encysting. Prof. Lyster gave a case where a sphacelus of the tibia had been removed by the use of carbolic acid without any ulceration.

Dr. Walker. One of the most important matters to call attention to is the hydra-dead monster, the new disease in the mouth from the use of rubber plates. He had met it before the war, but gave up practice then, and upon returning to practice again found trouble. In every case examined he found disease. There is first thickening of mucous membrane, then sores appear, looking often like a piece of half spoiled beef cut across the grain. He found the processes of the jaw bones often absorbed as a result of this disease.

Dr. E. A. Herman asked if the doctor saw it in any mouths where other plates were used.

Dr. Walker. No.

Dr. S. B. Palmer. Is the non-conducting property of the vulcanite the cause?

Dr. Walker thought the non-conductibility of the plates had little to do with it; he thought the work due to articles used in the manufacture, such as mercury, etc.

Dr. John Allen, of New York, spoke of a lady who had a set of teeth that caused sloughing of soft tissues and necrosis of palate. He analyzed a portion of the plate for the sake of determining what it contained. Her usefulness is entirely destroyed; her occupation, that of a school teacher, has gone. When last heard from, all hope was nearly gone. A continuous salivation was going on. His experience was that

in nearly every case where rubber is worn he had seen this soreness. His convictions, aside from any preference for other substances, are that it should not be used.

Dr. Morgan had seen few mouths where there was not a disease if artificial work was worn. Nature had not intended false roofs to be worn. He said Dr. Allport had reported one case where platina had been worn and given no trouble. He saw a case here in Tennessee, where a lady had trouble from wearing a plate of coined gold. Idiosyncrasies are discovered where false dentures are worn.

Another case cited was that of a lady wearing an eighteen carat gold plate, who had raw sores in her mouth; this was cured by wearing vulcanite. This does not prove any rule, however, for there are too many exceptions.

Dr. Atkinson. Did the patient wear the plate during the night?

Dr. Morgan. She did not, and often rested the mouth during the day; special regard was paid to cleanliness.

Dr. W. O. Kulp, of Iowa, said: Since this poison cry against the rubber base, I commenced a series of investigations, and, by the aid of friends, eleven hundred cases have been examined—seven hundred where red rubber was worn, one hundred and forty gold plates, two hundred and thirty silver plates, ten platina, and twenty of other bases, such as cheoplastic, tin, aluminium, etc. In proportion, we found fewer mouths in a diseased condition where rubber was worn than where silver; about as many in proportion where gold plate was used. Tin and cheoplastic uniformly produced a diseased condition of the mucons membrane; where aluminium, having teeth attached, with some other compound was worn, the diseased condition of the membrane extended all over the mouth. Uniformly the testimony was that rubber was worn with more ease than other substance, except from its extra thickness. The cleanest mouths, *i.e.* the most free from disease, were those where aluminm was used with teeth attached to plate with black rubber. My investigations illustrate that it is an abnormal condition to wear

a covering over the roof of the mouth, and that any plate is capable of producing a diseased condition of the mouth if worn constantly and not kept perfectly clean. The result of these investigations ought to make us redouble our efforts to reach the blessed time when no more artificial teeth are demanded, but when all the natural teeth will be saved.

Dr. W. A. Jones wished to state one matter—that in most of these cases mercury had been found present in the system. All metals have an affinity for mercury; probably platinum has the least. The worst cases he had seen were from wearing gold plates. He had seen less trouble from vulcanite than anything, except Dr. Allen's continuous gum work. He had a patient, a physician, who could not wear a gold plate but a few times. Every week or so, by taking out the plate, mercury was found upon it, which, being driven off by heat, he could wear it. A black rubber plate vulcanized very highly, was tried with success in this gentleman's mouth.

Dr. C. C. Carroll. Are we not off the subject of pathology?

Prof. Atkinson wished to ask if it is mercury, the metal or sulphuret of mercury, secreted in the system, which causes the trouble.

Dr. Jones could not answer whether it was the sulphuret or metallic mercury.

Dr. Allen. With reference to the trouble from platinum plate, the case mentioned was the only one he knew of where a plate properly fitting had given trouble. The swaging of the plate in base metal will account, he thinks, for the surface being covered with base metal. He takes special pains not to let the metal dies come in contact with the plate, putting thin tissue-paper between the plate and dies. He had found that the more continuously persons wear a plate, the better it fits, on that account he wears his plate all the time, even while sleeping.

Dr. J. P. Holmes. Does not the atmospheric chamber cause trouble?

Dr. Allen. Yes, in ninety nine cases in the hundred it is the unequal pressure. A deep air-chamber should not be used, as it draws down the mucous membrane.

Dr. Crouse. There certainly would be no more pressure in a deep air-chamber than in a shallow one, only that it would be more to fill up. As to the idea of mercury, quinine, or calomel in the system, it is all a notion. It is erroneous, and out of the question. He thought rubber produced more trouble than other substances, but this was due to the non-conductibility of the material. He had a case of granulated and thickened membrane under a vulcanite plate. The periosteum was diseased; teeth loosened. After removal of the plate for two weeks the teeth grew solid in their sockets. The plate was held in position by clasps; no air-pressure. It had been worn three years. He replaced this with a gold plate, and it gave comfort.

Dr. Walker. With regard to vulcanizing, he had found where highly vulcanized it was worse, and where the plate was close to the teeth or resting on them, he found them losing the lime salts more rapidly than when other materials were worn. With regard to cleanliness, where he had seen this trouble it was in the mouths of persons most careful and particular. In one case he had seen a gentleman whose mouth and throat were sore for some time after wearing a rubber plate. A physician of his city had had a relaxation of the palate from wearing a small plate.

Dr. J. W. Moffit, of Harrisburg, Pa., for fourteen years had been using plates of different materials. The friction was generally the cause of the disease, but in rubber plates he found an additional cause. One case was cited where a lady had her mouth covered with small ulcers. On laying aside the plate she recovered, and on the resumption of the plate the trouble returned.

Dr. I. Forbes of St. Louis. What was the temperament?

Dr. Walker had seen all temperaments affected. One case mentioned was *nervo-sanguine*.

Dr. Forbes. Was the nervous the predominant temperament?

Dr. Walker. No.

Dr. Forbes. Platinum is good conductor of electricity—better than gold, and he thought as good as copper. His humble judgement is that platinum plates will excite inflammation in mucous membrane sooner than any other. He had a patient who had worn a plate of platinum which gave trouble, but a gold plate gave none. Fillings of different materials will give trouble in the mouths of nervous people. Rubber he denied being a good conductor of heat. It had been lately demonstrated that the electricity of the mouth differed as the nervous system predominated; that fillings of different materials made batteries, and around one pole was found decay. The difference in the purity of metals he could not say would produce a current, but a tin or amalgam filling with gold would. Aluminum being a better conductor of electricity, would be a better filling material. With regard to scraping the periosteum and returning teeth, he had, when a young man, taken out and filled a wisdom tooth for a lady. It had lasted five or six years, and then he lost sight of the patient by her going away from the city. He had also extracted a bicuspid, and syringing out the cavity he replaced it. The tooth remained in the mouth for years, indeed until the death of the patient.

Dr. Walker said that, without any exception, he had found the disease in all cases and with all temperaments.

Dr. Peebles is of the opinion that the trouble in partial sets is mainly owing to the fact that in this kind of work they often fit up the plate to the necks of the teeth. This is to secure firmness and fixedness. When using gold we are not so particular, as the suction of the gold used is trusted to. He had put in a case of rubber where a lady wearing it was very ill for fifteen days after its use. A few hours after her arrival at her boarding-house, after having the plate put in her mouth, she was taken violently ill, vomiting a greenish fluid. He readjusted the plates, and called upon a physician who led her to think she was poisoned, and they agreed to keep her in town for another trial. The plates had been

vuicanized very hard. New ones were made not so hard, and in three hours she was again taken sick as before. He finally made gold plates, which gave no trouble.

Prof. Judd. This question is one of very great interest. He would fail in his duty to his profession and his conscience if he did not speak. He had no axes to grind, and no fight for or with anything—he only wanted truth. Let us look calmly at the subject. Should we not look to it that we do not produce worse diseases than we are called upon to relieve? He wished to call attention to the fact that there are various diseases caused by plates. Let us describe them as we see them,—one from mechanical irritation, another from poisoning, and another from suction or clogging the pores. No one in such a climate as he lives in could fail, if he closely examines, to find a disease from the use of plates. He had seen the mouth covered with spongy masses, filling up the arch with a soft tissue, such as he had never seen anywhere else, distinctly marking a different disease,—a purple-colored, strawberry-like looking mucous membrane. He could quote case after case where he had seen necrosis of the vomer, superior maxillary bones, etc. etc. These were generally in atrumous patients.

What are the plates made up of 40 per cent. rubber, 24 per cent. sulphur, and 36 per cent. of mercury? call them by their right names,—mercury and sulphur plates. It may be said that the material is insoluble; but so is arsenic, and who would put in an arsenical plate? He would not feel as if doing his duty if he recommended this compound of mercury, sulphur, and caoutchouc.

Prof. Atkinson. I am glad of all said, but am sorry to see us spending the time in the details of practical life. Let us try to understand principles, and be done with cradle songs. Men who have been pricked to the heart for love of truth must talk. I am not going to worship mercury or Hygeia,—she can take care of herself. Let us pour out whole mouthfuls of seed-thoughts. What is the cause of necrosis? Can mercury cause it? I challenge the world to prove it. I

hold that until made a binary it cannot enter the system, but may be between the cells as a simple element entangled in the tissues.

Let us get at truth only. Anybody who has shot squirrels goes to the hickories. Any one who wants to shoot mercury must not go into the bones, but go along the alveolar processes. It don't dissolve the tissue. What then, where a huge necrosis is found? It is syphilis; he would chase it out like a squirrel, and tell the length of its tail. Syphilis is the cause; it is the result of transgression of connubial law. Treat the case as if it were syphilis, and, if proper means are used, if you are not successful, send the bill to me, and I will take care of it financially.

In primary syphilis, extirpate the first portion of poison before it has time to telegraph to the whole body. In secondary, use biniodide of mercury and potash. In tertiary, just go it on iodide of sodium. Circulation, respiration, and innervation mean digestion—that is, of the pabulum on which the tissues feed. After this comes the assimilation. Cleanliness would cure the whole thing, if we knew what it meant, or how to go back and clean every tissue.

Extract no more teeth; mutilate no more people. Every time we do we lay the bone liable to disease, and the teeth are not there to warn us of it. Outside of zymotic diseases there is none other than syphilis or its effect, resulting from a poison that perhaps may have been introduced into the system of ancestors and handed down. Enamel, dentine, cementum, and bone are all under crystallosophy, and for this he dissolves out the mineral portion and leaves only the animal portion to bring about the cure under the ghosts of their corpuscles.

If gentlemen will say that rubber was the exciting cause for the disease, don't for five, ten, thirty, fifty, or one hundred and fifty dollars, cut your souls all into scars, so that when you come to heaven's gate Peter won't know you.

Committee on Dental Ethics filled by Prof. J. S. Knapp, of New Orleans.



A letter from Prof. J.B. Lindsey, M. D. of the Faculty of the University of Nashville, was read, inviting the members of the American Dental Association to visit the museum. Half-past two o'clock on Thursday, was the hour decided upon for the visit, and the invitation was accepted.

SECOND DAY.—*Afternoon Session.*

Minutes read and approved.

The Chair appointed as Committee on Mechanical Dentistry, Drs. Wright and T. T. Moore, of Columbus, S. C.

Dr. Cushing called attention to the marked difference in the experience of persons from various sections of the country, seeming to show something to be due to the climatic influence. In the case spoken of by Dr. Crouse, he had noticed that the mucous membrane, where the plate was not worn, was very healthy in appearance. He had not seen trouble from either gold or platinum plates.

Dr. Taft. This is an exceedingly broad subject, as indicated by the range of the discussion. He preferred that they be confined to general principles, rather than to mentioning the minutiae of cases. Every one who feels an interest in maintaining these bodies in good condition will see the necessity that this discussion must be kept within bounds. It is more pleasant to contemplate the body in healthy working condition than in disease. Perhaps we, in our anxiety to contend with and vanquish disease, go too far; nevertheless we meet with disease to be remedied and overcome. He had been much interested and instructed in the discussion. The causes of these affections have been referred to, but not as fully as we could wish. Disturbances result from various causes, and doubtless all see how important it is to study for themselves, so as to become familiar with idiosyncrasies and differences of constitution. It is imperative that all should understand the laws of life.

He said Prof. Atkinson seemed to consider all disease due to the introduction of inimical material into the system. No doubt with some but a small amount will, if introduced, produce trouble. The treatment of wasted alveolar process

and diseased bone—namely, the introduction of properly diluted sulphuric acid, so as to dissolve and permit the diseased bone to be washed away—of course requires care and knowledge. Other acids were mentioned by Prof. Cutler; but he thought the sulphuric acid would act without injuring the living part beyond the diseased. Nitric acid or glacial acetic acid would not operate so well. The method of applying was interesting, opening up the cavity and introducing the tent, making but small disturbance among the soft parts around. This requires great care in its use.

For abscesses he had used the tangle tent, a woody, fibrous structure, which, on being introduced, expands from two to four times its diameter, opening up the fistula so as to admit of treatment. There are various causes to be taken into account; their character should be well understood, and the character of the structure should be considered. The structure has its individuality, like the face or body,—one is of strong the other feeble vitality. It has been said that all are alike in this, and that the difference of susceptibility is due to the difference of the working of the organs. We should study all these differences, and although there is much that cannot be readily found there is that which is readily seen upon examination. Some may be able to diagnose without being able to convey to one another how it is done. We must study nature and physiology, and governing laws. Sometimes he thinks we live to fight this enemy of ours, but he would say that it is important to prevent the entrance of disease.

Prof. Cutler would ask what constitutes pathology, if it is not deviation from physiology. When the dentist extracts teeth, is he not bringing about a pathological condition? When he converts the pathology into physiology, then he is a surgeon; but the other operation is that butchery of extracting teeth as performed by quacks, who replace them with their miserable substitutes. He thought it the duty of mothers, of teachers of day and Sunday-schools, to teach the im

portance of preserving the teeth. As to the subject of rubber, to arrive at the discovery of the causes of these troubles from different kind of plates, we must understand all this vast subject of molecules of matter. A plate cannot press anywhere without producing a disease. One may be a poor conductor, or another too good a conductor of either heat or electricity. With strong vital temperaments people may tamper with their digestive apparatus, but the delicate suffer from dyspepsia on the slightest provocation. What is nutrition and weight? His observation is that it depends upon oxygenation; this goes in and seizes upon the living tissues, taking out carbon and hydrogen, and, carrying these out throws them off. To do this the oxygen must be ozone, or in its nascent state, ready to unite with the other elements. The remedy for all disease is first to remove the cause, and if the plate is that cause, take it out.

Dr. Morgan does not profess to understand chemistry to any considerable extent. There are, however, some facts in connection with the use of sulphuric acid. We all know that with living tissues it has a very different action than upon dead. Our surgeons often use this acid for bringing out granulations and restoring lost parts. He thought disease did not come from outside causes alone. If something was taken out of the body, as caloric, we would have disease. He did not know how far magnetism and electricity may affect the system. That the loss of these might affect the health, was possible.

Prof. Taft. The argument of Dr. Morgan, of pathological conditions resulting from the abstraction of caloric, is in favor of Prof. Atkinson's assertion, for this allows the *debris* to remain, and they are certainly foreign matter then. Taking cold is simply holding in and damming back some material which should be thrown out. The pabulum passing in and out of the tissues is essential for the production of heat. By the change of the elements within the body, the force is eliminated which is essential to the condition of health. Motion or movement is a result. It is under the

domination of the vital force. Anything arresting or disturbing the conditions of this force aids and produces pathological conditions, whether it comes from within or without. Even a mental condition may produce disease.

Dr. Morgan. Prof. Taft has carried out just the idea which he wished to demonstrate,—the loss of motion or force will cause disease.

Dr. Willis. Much has been said of the manner in which certain functions are performed. But now, why do these changes take place, so as to avoid the rock of which Prof. Atkinson has spoken? The great central force is the sun, and not a single force is in existence which cannot be traced to it. He takes man merely as a machine,—he has nothing to do with his soul. How is the heat in man kept up? Just as in a steam-engine, only that we have an arrangement to carry out the *debris*. The coal contains the force, which was obtained by the vegetation of which it is formed, from the sun. Caloric is not a substance; heat is only a condition.

Prof. Sheppard moved the discussion be closed. Carried.

The report of the committee on Dental Chemistry was then called for.

Dr. Allen. Chairman, reported. The paper related to food. He then said: Let us refer to food, and we find that other nations, who do not change the proportions of natural food as we have done, do not lose their teeth as we do. The Creator has taken the trouble to prepare our foods properly, and we go to work and throw out the mineral portion. 40 lbs. are taken from every barrel of flour, and a child, it is estimated, uses half a barrel per year. Thus it loses 20 lbs. per year, or in 20 years, 400 lbs.: 13, 000 milling establishments and 28, 000 men are employed to do this, while 10, 000 dentists are trying to patch up the loss. The result is that twenty millions of teeth are annually sacrificed, at the nearest estimate. He was pleased to see it proposed to teach children in our schools about the nourishment proper to use. Every old woman knows that her hens require lime to make shells for their eggs.

Prof. Cutler. Children require, in proportion to their weight, more food. His observations have satisfied him that the lacunæ of bone become filled up with the mineral element, making old age and its chilling coldness. The flesh of old age is tougher, more yellow, dense, etc., from its loss of water. Can we extend the life of man,—can we put off the arrival of old age? Can we keep up a normal condition of these bones? If we can take a miserable tuber and cultivate it into a cabbage we can do this. He thought all men suicides who die from old age. We are all such without knowing it. When developing, feed with the mineral, but when the man has matured, crowd him with fine flour. No change takes place in hard tissues after they are once fully formed. In relation to the amount of lime, he proposed to use acid fruit, especially if we use limy food, as the oyster, etc. You do not find osseous deposits in the valves of the heart until the bones are filled up first.

Dr. Peebles thought, if he had known it sooner, he would have fed his children on bran instead of flour, as it would be cheaper, but he liked to give them as good food as he used. How will we be able to go at this? Can we change the whole system of our lives?

Dr. Allen. One remark in reply to Prof. Cutler. In Europe, where the poor do not change the proportions of the food, they have better teeth than the aristocracy. When they come here they do lose their teeth, and why is this? Because they neglect to supply the deficiency of loss. It is well established that the hard tissues do change, and it is essential to keep up the supply for the loss to be replaced. We should popularize the idea of grinding up the whole grain as the ancients did.

Dr. Dickerman. There seems to be a difference of opinion as to the change of the teeth; may not the climate have something to do with this? He would say that the Graham flour was \$1.75 more per barrel, as they cannot cheat as well in the weight as with white flour.

Dr. Allen. In reply to the climate, he would refer to

Humboldt, who says the teeth of Indians of all sections were sound. It depends upon the food.

Dr. Allport. We have heard much of late years about proper food. He would not combat the theory, but he felt that the ability of the system to make it up was a matter of importance. He had hardly credited the statement with reference to the health of teeth of peasants abroad. He concluded after examination, that there was not such a difference. In England he thought the teeth worse than in this country; among the nobility good, regular teeth are hardly to be found. The simple idea that they are better is only due to the fact that in Europe they do not think or care for their teeth as we do. It is more due to the intelligence of the people, and their constantly speaking of their teeth, as is done in this country.

Dr. Allen did not consider that Dr. Allport was much among the peasantry proper while in Europe. Hack-drivers and waiters live on finer food than the peasant. Many years ago, through the South, he examined the teeth, and found that the field-hands, as a general rule, had good teeth, but the domestics and whites had poor.

Dr. Morgan. Have you any conception of the number examined? How many did you ever see of thirty years of age with sound teeth? He had seen but one of mixed blood who had sound teeth, The negroes are almost universally scrofulous and with unsound teeth.

Dr. Carroll. Having read the paper of Dr. Allen, he used it almost as a text-book, and referred many of his patients to it. He did not think the food alone resided in the flour. The males generally have better teeth than the females. Why? The air breathed has much to do with this. We ignore too often the food taken into our lungs.

Dr. S. A. Chisholm could bring to bear a single experiment. In the inland towns among the Mexicans he found many fine teeth: they lived on rough, plain food. On his return to San Antonio, he found those there had bad teeth. This brought him back to the Harris doctrine,—that as our

teeth are developed so they remain. Cleanliness, etc. are necessary for healthy teeth.

Prof. J. S. Knapp. Should we discuss so wide a sphere?

Prof. Stellwagen said that, after reading Dr. Allen's report, he had become more impressed with the truth of the theory. What can be plainer than the proposition that, if the elements necessary for the formation of the dental structures are not introduced into the system, we cannot expect to find well-developed and normal organs?—or can we better select the proportions of our food than has been already done for us by nature?

With his own family he had experienced some of the difficulty spoken of in introducing the use of the bran bread, but he thought he had seen the benefit of it. He also laid great stress upon the importance of keeping the saliva in an alkaline condition. This, if it only prevents the acid action between the teeth, does well; but he was almost ready to search for direct osmosis between the fluids of the pulp and tubuli and mouth. The practice of this is simple enough consisting merely in rubbing *prepared* chalk around the mouth pressing it between the teeth upon retiring, and washing out thoroughly, two or three times every day, with lime water.

His first child, a daughter, erupted most of her teeth prematurely, her second deciduous molars coming through when she was nineteen months old; the inferior were so defective that he was forced to fill one with gold, and the other (from the close proximity of the disease to the pulp, leaving but a thin septum of dentine intervening, so that it could not withstand the pressure for consolidating the metal) with amalgam. There were several other small cavities left at the time. Dreading to operate, he had postponed filling until the child was thirty-one months of age, when he had excavated one which presented the worst appearance, to satisfy himself if there was much softening under the enamel, and he found no more than he considered an average amount, but felt that the tooth up to that time was very little, if any,



worse than when the first fillings had been inserted, *ten* months before. During this time he had had the child's mouth treated with the chalk and lime-water. Bread made from flour that had not been robbed of its bran was eaten very freely, but not exclusively, every day in the week. In this way he thought that kind of bread was very palatable and appetizing.

The cow's milk used by his children,—for they both had to depend mostly upon artificial food,—after being properly diluted with water, to prevent overtaking their digestive powers, or rather to give it about the same proportion of water as in human milk, was sweetened, and to every half pint one teaspoonful of lime water was added. His second child, a daughter also, had been fed with milk prepared in this way from the time she was ten months old, and her teeth were much better in appearance and texture. He attributed it to the difference in the diet and the use of antacids.

Plenty of good air and sunlight were of course indispensable for all persons having diatheses favoring caries; the chemical and vital forces must be kept up by free supplies of their correlative forces, heat, light, electricity, etc. For this purpose he advised all his patients to take regular walks on the sunny side of the street; children he preferred to have spend as much as possible of their time in the open and direct rays of the sun.

In treating teeth, a dentist should never forget that they are part and parcel of the whole economy; if diseased, the vital force of the individual must be cared for, and, if necessary, his system elevated to the proper standard by attention to open air exercises in the sunlight, food, and these sometimes assisted by the *materia medica*. In many cases he had refused to operate until the general health was restored; found patients thus treated were better able to stand the pain; presented mouths whose secretions were nearer the normal condition, and, consequently, the fillings could be very naturally expected to remain intact.



He hoped others present would give their experience with the chalk, lime water, bran bread, etc., in a word, the treatment spoken of. He felt satisfied that it could do no harm, and in some fifty cases, where pretty thoroughly tried, the condition of the teeth was materially improved, the dentine in some becoming harder, and less frequently attacked by caries. In this way he hoped the profession would make a material steps towards improving these organs in coming generations as well as the present one, and thus hasten the millennium when dentists and physicians should no longer be required.

*To be Continued.*

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### ARTICLE III.

#### *Dental Neuralgia.*

By S. P. CUTLER, M.D., D.D.S.

Read before the Tennessee State Dental Association.

**DENTAL NEURALGIA.** *Surgical Operation.*—An Irish woman about 35 years old who had been the victim of neuralgia in the left inferior maxilla of the most intense character, in consequence submitted to surgical interference for relief, in the hospital at Cleaveland, Ohio, about two years before the time of the second operation, which I witnessed at the hospital at Cincinnati, in the winter of 1867.

The first operation consisted in trephining the lower maxilla with a small trephine opposite the sapient tooth (which had been previously extracted, also all the teeth on that side to the cuspid without relief,) by making a longitudinal incision just at the lower border of the jaw, dissecting up the flap and cutting through the masseter to the bone, then sawing down to the dental canal, and with the trephine removing a small section of the inferior dental nerve as well as the vessels.

This operation afforded only temporary relief, the paroxisms returning with the most intense suffering at stated periods, showing conclusively that the diagnosis had been at

sult, and the operation an entire failure as might reasonably have been expected after the removal of said teeth failed to afford relief.

The second operation was performed by Prof. Blackman, of the Ohio Medical College, Cincinnati, during the winter of 1867-'68, at the Charity Hospital, before the medical and dental faculties and classes.

The poor woman at the time was about seven months enceinte. She was placed on the operating table in the amphitheatre and put under the influence of chlorform, after the Professor had made an interesting statement concerning the operation. The operation was commenced by making a longitudinal incision first under the lower margin of the bone some two inches in length, dissecting up the flaps and making sufficient room for the operation. The facial artery being ligated a second incision was made down to the bone about two inches in length, extending a little in front of the mental foramen, then cutting down to the maxillary nerve canal with the small trephine, about opposite the last molar region; then with a bone excising forceps the bone was removed in front to the mental foramen, cleaning out the entire canal and foramen, which completed the operation, the integuments being saturated and dressed in the usual way. After the woman came to, she said she felt perfectly relieved and that she had rather undergo the operation every week than to suffer what she had.

Prof. Blackman stated that he did not have much confidence in the final result of the operation, and that if there was a return of the disease he intended to make an operation through the antrum with the small trephine and remove Peckle's ganglion.

The disease having returned in the course of a few days after the first operation as Prof. B. anticipated, he performed the operation as above contemplated with entire relief, and no symptoms of return up to the time I saw him last which was two weeks after his first operation. Whether the success was final or not I never heard.

The patient, a laboring woman, could assign no cause for the disease, only cold from exposure, her teeth being sound. In the first place, it was mal-practice to extract the teeth on that side, when there was no indication of disease about them. In the second place, it was doubtful practice to trephine the bone and remove a section of the inferior dental nerve, unless the symptoms were clear and pointed. In the third place, it was not only doubtful surgery but clearly mal-practice to trephine the second time as after the removal of so much bone and the nerve, provided the first operation had been well performed and the section of nerve entirely removed, there could not have been any reunion or reestablishment of nerve; neither is there any anastomosis that could possibly communicate with the brain anterior to the point of the first trephining, a fact which should have been known to the Surgeon, and negatived the second operation altogether. All the operations performed on this poor woman were but so many gropings in the dark, without any guarantee at all of final relief. If the cause of the disease was not removed, a return of it was certain to follow sooner or later, perhaps with renewed energy, the operations serving only the purpose of temporary counter irritation. In this obscure case the cause may have existed still back of the points reached by the respective operations.

In the first place our knowledge of the exact pathology of neuralgia is very obscure, owing mainly to the fact of our limited knowledge of mere force or function, whatever it may be, for, when in a normal condition, effects follow cause in harmonious sequence, just as much as the falling of an apple to the earth responds to a cause called gravity, one being physiological, the other cosmical, and both under one common head denominated physical.

Normal physiological causes produce normal effects, and abnormal causes abnormal effects, pain and neuralgia being the result. Here then there must be looked for a violation of law, and neuralgia the result, as all violations of law have defined fixed penalties being natural sequences.

There may be, in some instances, spicula of bone growing in upon the trunk of a sentient nerve, producing disturbance between that point and the brain, causing pain from irregular neural transmission of force to the brain. Or there may be congestion in the neurilemma and thickening, thereby causing pain from pressure, or there may be strictures of the trunk resulting from external inflammation either acute or sub-acute, producing pressure on the axis cylinder and pain, or the heat of inflammation alone may be sufficient to cause pain by a preponderance of the chemical over the vital forces, oxidation subsidising nutrition which causes disturbance in the normal forces, nerve force being converted into heat force to an abnormal degree. Any traumatic injury of a nerve may heal by the first intention, without any neuralgia, or take on a morbid healing process producing either temporary or permanent neuralgia. The fangs of the lower wisdom teeth when long and the depth of jaw shallow, may in their growth intrude upon the maxillary canal and produce neuralgia by pressure on the trunk, which can readily be diagnosed and relief always obtained by extraction, if not by any other means. Tooth-ache from any cause whatever, is nothing less than dental neuralgia effecting the entire nervous system by sympathetic relation through ganglionic media, they being the outposts of the great central sensorial reservoir, where all dispatches are received on the one hand, and distributed on the other, to every point in the organism.

Dental or tooth neuralgia is more radically diagnosed and accounted for than any form of neuralgia, from the fact that the causes are readily arrived at, and acceptable when existing as such, uncomplicated with any other pathological condition. In the first place the dental pulp is enclosed or surrounded by solid unyielding eburnia substance, or ivory walls incapable, as is the case with sarcode, of diluting or yielding to the expansive force of over action of the heart and arteries, as in inflammations causing pain and intensified according to degree of heart's action the result of pressure, and thereby obstruction of nerve transmission, then again

independent of pressure, preternatural chemical action or oxidation and corresponding diminution of nutrition, causing irregular or abnormal transmission of neural force resulting in pain ; or there may be a still lower degree of pressure, the result of stasis of blood or stagnation of actual inflammation, causing only promonitory symptoms of what is about to follow if not relieved . There is another condition called hyperæsthesia or exalted sensitiveness of dentine, the cause of which is exceedingly obscure, not depending on any of the above named conditions, which is annoying to both dentist and patient in operating on the teeth,—a condition of things demanding of our hands more scientific knowledge than we at present possess. Alveolar abscess, caused by dead teeth and fangs, is another common cause of dental neuralgia, which need seldom ever be incorrectly diagnosed, and the remedy always reliable, that is removal of such teeth and fangs if not otherwise curable.

Dead and diseased teeth and fangs cause neuralgia by their disturbance acting more or less as a foreign body in the jaw bone, the disturbance consisting of sub-acute or chronic inflammation of the bone extending to the trunk of the dental nerve and to the brain. Increase of blood produces pressure and undue oxidation in the vessels, causing irregular nerve transmission, resulting in painful impressions in the cerebrum. Relieve this trouble, the inflammation must be subdued, and the circulation of the blood restored to its normal condition which is always more difficult to do in a bony structure than in any other tissue, recovery to perfect health in said tissue requiring more time than in any other, though when perfectly restored the tissue is perfectly normal bearing no scars. There can be no disease in a part where the circulation of blood is perfectly normal, there must first always be an over or an under action of the capillaries in any tissue before disease is established, even when resulting from traumatic injuries, cause and effect being always inseparable companions in the first instance. Why pain follows local disturbance is one of the life mysteries not yet fully comprehended

or why man and animals are sentient creatures at all is equally mysterious and incomprehensible.

To cure neuralgia, or in fact any other disease, the first step should be to try and find the cause, and if practicable remove such cause as a preliminary step, then the effect may in many instances subside without any farther interference—as an instance, the extraction of diseased teeth generally affords perfect and permanent relief without any further interference.

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#### ARTICLE IV.

*Address before the Tennessee State Dental Association.*

BY S. J. COBB. D. D. S.

Gentlemen of the Tennessee Dental Association.

Not having had an opportunity of returning my thanks at the time of your electing me President of our Society, I now thank you most kindly for the honor conferred. And while I am satisfied you could have selected another more competent to have served you, I will say I have discharged the duties of the office to the best of my ability, and therefore I hope you will excuse my many short comings and allow me to return thanks for courtesies extended during the meeting. This being my first effort on an occasion of this kind, I am sure you will not expect much in the way of a speech, in fact if I had the experience and ability to make you a long and interesting one, I do not think the occasion demands it, therefore I shall confine myself to a few remarks on the importance of legitimate associated effort. This gentlemen has ever been a subject of interest with me. I am aware of the fact that we have some few in our profession who are, to some extent, opposed to societies, and, I am sorry to say, a goodly number who have yet to manifest much interest in them. This, in my opinion, is attributable to two cause, in the first place our profession being young it has not had time to build up sufficiently to interest the masses in this way, and in the second place, as is the case in everything



else, some few men have attempted to take hold and run some of our societies as they would machinery, for the purpose of grinding out their own aggrandizement. In this way I have no doubt some have been brought to a premature end. This I trust will never be the case with our Tennessee Association. In the life and death of others I hope we have had experience enough to enable us (as doctors) to administer to the wants of this society, to make it not only long lived, but sufficiently healthy to ingraft itself upon the next generation as a permanent and indispensable institution. To do this it becomes the duty of every dentist in the State, to put his shoulder to the wheel and see that all push together—this is the object of associated effort; it is utterly impossible to accomplish singly and alone such results as can otherwise be done.

If any one doubts this statement let him cast his eye back over the history of the past, and behold how sublime the result of combined effort. It makes a garden of the wilderness, a civilized man of the heathen; by it our institutions of learning spring up and flourish, and our legislation is accomplished, and it is by united effort that our church organizations are enabled to wield such influence over the masses. By it governments are made and destroyed, in a word united effort wields the thunderbolt of power, it is the Archimedian lever by which the world is moved.

This being true, why should we hesitate to organize, drill and discipline our forces for the great victory to be achieved by associated effort.

We have at present about two hundred dentists in our State, the same number going out to do battle for their country, would organize, drill and discipline themselves in such a way as not only to make every move scientifically, but jointly and understandingly. If this be necessary for men who go into the field to kill one another, I am sure it is none the less so for us, as a little dental army, to do battle for the living.

It is true our enemy does not come with sword and bay-

onet in hand, but so disguised and in so many different ways, that it requires ten times the science and skill to defeat, as does the bold and daring soldier. As such I appeal to every gentleman present to look well to the interest of this society, to see that each and every one returns next year not only a better dentist, but with a number of new and good applicants for membership. Let us go on in this way until we get into our ranks every respectable dental practitioner in the State, and as many more as may wish to join. In the mean time we must see that nothing is left undone that will contribute to our science, skill, and brotherly love. I fear gentlemen we do not understand and appreciate the importance of brotherly love. To advance in dental science as we are capable of doing, we should work as a band of brothers. I do not see why we should not to a very great extent become personal friends, especially where we reside in the same cities and towns; in this way we might put an end to our professional bickerings and jealousies; the aim and end of all in one sense are the same. We are all engaged in the practice of dentistry for the purpose of making money, or in other words a living; the great misfortune is, we do not understand ourselves, one will go at it in one way and another in another, some take so little thought upon the subject that they conclude it is best to humbug and swindle everybody they come in contact with, while others seem to think they can do nothing except at the expense of others; as a matter of course they are always trying to pull others down to get up themselves. Then again we find others who are so jealous and narrow minded, that they can see no room upwards for any one but themselves. This gentlemen is all wrong, the platform of greatness is sufficiently large for the whole human family; as for pulling others down to get up ourselves, it is simply a mistake for the want of better judgment, and when it comes to cheating and defrauding, it is certainly a disgrace to all who are engaged in it, while this little narrow minded sickly view, prompted by jealousy, is little better. To sum the whole thing up, it seems to be



attributable to the want of more knowledge of the great living principle that rules and governs all matter, man included. This great principle establishes the fact that what is good for the whole is equally good for an individual. No one who comprehends and thoroughly understands it, can afford to engage in humbugging his fellow man, or attempt to elevate himself upon the downfall of others; neither will he in any way appropriate the labor of others, nor say or do any thing whatever that will hinder any one from reaching the top-most round in the ladder. He knows too well he is a part and parcel of the same; he understands enough of the philosophy of life to know that the happiness of man depends upon the conduct of one another, it is an established fact with him that no one can live within himself. To obtain the greatest degree of excellence and happiness he must endeavor to take all upon a level with himself, onward and upward. I hope every member of this Society will take up this subject, and investigate it thoroughly, get the truth out of it, and govern himself accordingly, just as we do this we become better men, do better dentistry, make more money, live longer, and enjoy life the better. In conclusion, gentlemen, I hope you will allow me to call attention to our constitution, by laws, and ethics, which you will find on the Secretary's table. Those who have not provided themselves with a copy, I hope will do so before leaving, and when you go home read carefully, so as to understand thoroughly, and live up to it to a letter. We do not claim for it perfection, but it is the best we have thus far been able to get up; by learning and living up to it, we will be the better able to make good its imperfections. Some may argue, which I have heard even in our American Dental Association, that we need nothing of the kind, but when we take into consideration that law is the great civilizer of man, and without it, we would simply be a set of desperadoes, constantly engaged in pillage and murder, it is evident that we can not get along without it. Without law our happiness and comfort in life would be limited to a very

great extent; it is intended as the sign board at the forks and crossings of roads, to direct us in the way we should go. The man who says he will dispense with it, had as well say he can travel successfully the world over without reading a sign or asking a question in regard to his rout. Our constitution, by laws and code of ethics, are extended to direct us in the way we should go, and I for one insist on every member of this society going on as it directs, and if any part of it should lead us astray, we will find it out and correct the error; in this way we may become as a band of brothers laboring as one man.

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## SELECTED ARTICLES.

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### ARTICLE V.

#### *Encysted Tumors.*

A lecture delivered at Bellevue Hospital Medical College.

By Prof. FRANK H. HAMILTON, M. D.

*Ranula; or Encysted Tumors of the Ducts of either the Submaxillary or Sublingual Glands—Syn. Batrachos; Frog-Tongue.*—The term ranula, from the Latin *rana*, has by some writers been restricted to obstructions of Wharton's duct, and by others to obstructions of the sublingual ducts. There is sufficient evidence, however, that a tumor answering to the description of a ranula, is found occasionally in the duct of the submaxillary gland, and sometimes, also, in the ducts of the sublingual. Serous cysts may also arise in the substance of either of these glands probably in their connective tissue, independent of their ducts. Tumors having some points of resemblance to a ranula may originate in obstructed muciperous glands. Finally, there are many examples of enlarged submaxillary bursæ, which very much resemble a ranula in their external appearance. It is proposed however, to limit the term to obstructions of the ducts of the submaxillary and sublingual glands. To the other forms of encysted tumors resembling ranula, the term "spurious," may be conveniently applied.

The differential diagnosis between these various forms, is usually attended with so many difficulties, that it seems proper to make a brief allusion to the anatomy and situation of the submaxillary and sublingual glands.

The submaxillary glands are situated below the inferior maxilla, in the anterior portions of submaxillary triangles. They are covered by the integument, the platysma myoides muscles and the deep cervical fascia. The duct of each gland, called the duct of Wharton, commences by numerous radicals, within the substance of the gland, forming a single tube of about two inches in length, and with walls much thinner than those of the parotid duct, terminating in a narrow orifice on the summit of a small papilla at the side of the frænum linguæ.

The sublingual glands, weighing usually about one dram ; they are situated beneath the mucous membrane of the floor of the mouth, on each side of the frænum linguæ, reaching from the anterior margin of the submaxillary gland to the symphysis mentis. Their ducts, of which there are from eighteen to twenty for each gland, open into the mouth on the elevated crests of mucous membrane, caused by the projections of the glands on each side of the frænum.

While in some cases an exact differential diagnosis may be impossible, it is not difficult in many examples of tumors presenting the general appearance of ranula to determine the organ or structure to which they belong.

An obstructed submaxillary duct, in case the obstruction is at or near its origin, forms an ovoid, elastic, translucent swelling, first noticed beneath the tongue on one side of the frænum ; and it does not press downward and give to the throat the peculiar fullness below the chin from which its name ranula is derived, until it has attained considerable size. Usually such tumors are not seen of a size larger than an almond ; but in a few instances they have been known to enlarge to such a volume as to threaten suffocation. When opened, they are found to contain a perfectly clear, albuminous fluid, of the consistence of the white of an egg,

with an alkaline reaction. They sometimes contain solid, phosphatic concretions; and in such cases the presence of these bodies may be recognized by the peculiar feel before the sac is opened.

When these tumors attain considerable size, they involve sometimes the whole length of Wharton's duct, including the canals leading into the gland; under which circumstances the gland occasionally undergoes absorption, in consequence of the pressure; and the tumor ceases to enlarge.

Obstructions of the sublingual ducts give rise to similar tumors, commencing first within the mouth, and subsequently pressing downwards, causing in some cases also, atrophy of the gland, and a consequent arrest of the growth of the tumor. The fluid found in the sublingual ducts differs from that secreted by the submaxillary gland only in being a little more viscid; but Rokitansky affirms that calculi occur in these ducts much more often than in the submaxillary. They are usually white and friable, varying in form and in size from a millet seed to a hazel nut.

Of both these forms of tumors there may be presented rare and exceptional examples, in which the obstruction taking place remote from the orifice, and perhaps near the glands, the pellucid oval projection beneath the tongue does not occur; but from an early period there is quite as much prominence caused by the tumor below the chin as in the floor of the mouth. When the tumor commences in the ducts within the gland itself, as I have seen happen several times, the floor of the mouth is only encroached upon at a late period. But their anatomical character may still be determined by the position of the tumors, and their previous history. I have sometimes been able to determine whether the ducts of Wharton were involved, by a careful examination of the orifices of the ducts, and by the salivary jet.

Those tumors which result from obstruction of the muciparous glands, are now circular in form, and probably never attain much size, or press downwards, into the neck. They

contain an abundance of epithelial cells, degenerated epithelium, oil cells, and granulation cells, giving to the contents the consistence of oil or of putty. They are opaque, although covered only by mucous membrane, and in this regard differ from the two forms before mentioned.

Tumors formed from the connective tissue in this region are not translucent. They lie usually more deeply, and contain serum only, very slightly colored, and probably some phosphates or calcareous concretions.

Finally, tumors occasioned by enlargement of bursæ, lie deeper from the floor of the mouth, projecting less into its cavity, and much more below the chin. They contain a clear serum, or serum colored by more or less blood corpuscles. These are sometimes congenital.

It may be proper to call attention again to the fact, that I have enumerated two forms of true ranula; one in which the obstructions of the duct takes place at or near its orifice, and which is characterized by the translucent sublingual tumors, accompanied with more or less projection below the chin; and a second, in which the obstruction occurs at or near the gland, and there is no sublingual translucent tumors, but only a general uplifting of the floor of the mouth, and much greater prominence of the tumor below the chin.

There is also a third condition to which I called attention in a communication made to the *GAZETTE* in February, 1868, in which the obstructions occurring in any portion of the duct, is partial and temporary, and does not occasion, properly speaking an encysted tumor, but a sudden dilatation of all the radicals situated within the gland, causing the gland to enlarge, especially during the act of mastication. In such cases, as in one example cited, an active cathartic may accomplish relief; or the fluid may be expressed by pressure upon the gland. If however, the obstruction is continued a sufficient length of time, the walls of the ducts yield at one point or other, and a cyst is formed.

*Treatment.*—The treatment of that form of true ranula caused by obstructions at or near the orifice of the ducts,

consists in opening the sac, evacuating its contents and, maintaining or re-establishing the orifice.

It has been observed that the fistulous orifice thus made, cannot always be maintained if the sac is simply incised; but that it is often necessary to remove a large portion of the sac, so as to prevent the edges from falling into contact; and that a successful result is more certainly ensured by cauterizing the edges and interior of the sac, and then laying a bit of lint between the edges of the wound.

In case the obstruction is at or near the gland and the substance of the gland itself is involved in the tumor, as may be indicated by the fact that the tumor does not present the usual translucent appearance under the tongue, but seems to lie deep under the floor of the mouth, projecting chiefly beneath the chin, between it and the hyoid bone, then it will be more prudent to open the sac from the most salient point below the chin; and after the lapse of several days, when the sac has been thoroughly drained, to seek to destroy its secreting surface by injections of tincture of iodine, tents, etc. Opening the sac from the mouth under these circumstances, is attended with the hazard of hæmorrhage; and as it must be kept open a long time, it is exceedingly annoying to the patient; it is more difficult to maintain the fistulous orifice; and finally, it is not so likely to result in a complete obliteration of both the duct and the gland, which must be now the chief point to be attained.

Moreover, it is the form of ranula which is most likely to be confounded with simple serous cysts developed in the substance of the gland, or in the connective tissue adjacent, or with bursal tumors, in either of which latter cases complete destruction of the secreting surfaces and not the re-establishment of the original canal, is to be desired. The destruction of the cyst can be accomplished with the most certainty, through an external, free, and depending opening.

It is true, however, that in the case of simple cysts, here as elsewhere, it is preferable to remove the cyst entire by dissection; but the difficulty in any case of making an accu-

rate diagnosis and the embarrassments which often attend the destruction of encysted tumors in this region, will justify the surgeon generally in resorting to incision rather than excision.

Finally, the treatment of these various tumors, including ranula properly so called, and spurious ranula, may be summed up as follows:

In case of a well characterized translucent ranula, presenting itself almost exclusively within the mouth, an attempt must be made to re-establish the opening of the duct by free excision of the projecting portions.

In case of a deep-seated ranula, probably involving the gland, it is more prudent to open from the integument; and success is more certainly ensured by continual suppuration, causing thereby a destruction of both the duct and the remnant of the gland itself.

In case of a bursæ, the same course should be pursued as in the deep seated ranula.

And while in case of a simple serous cyst, formed either in the gland or the adjacent connective tissue, if the diagnosis were complete it might be proper to attempt its extirpation by dissection; yet considering the difficulty of diagnosis, the hazards and difficulties of the operation, and the generally successful results of incision followed by injections, the latter course must generally commend itself to the prudent surgeon; that is to say, the same treatment as for a deep-seated ranula, or a bursa.

*Encysted Tumors of the Parotid Gland and of its Ducts.*—The parotid gland, situated upon the side of the face in front of the ear, is the largest of all the salivary glands. Its excretory duct originates by numerous radicles, which unite within the substance of the gland to form a common duct, called the duct of Steno, which passes almost directly forwards over the masseter, penetrating the buccinator, and after coursing a short distance between the buccinator and mucous membrane, enters the buccal cavity opposite the second molar of the upper jaw. Its walls are



dense, consisting of an outer, or fibrous coat, containing contractile fibres, and an inner or mucous coat, lined with columnar epithelium. The canal is about the size of a crow quill.

The secretion of the parotid is clear and watery in appearance, has a mucilaginous feel, it is alkaline in its reaction, and, among other ingredients, contains always a compound of sulpho-cyanogen.

Obstructions of the duct of Steno have not hitherto been classified as tumors; and probably for the reason that they cannot in any case be subjected properly to the same treatment which is applicable to other tumors; that is to say, they can never be properly treated by extirpation—the only proper surgical expedient is to attempt to re-establish the communication with the buccal cavity; but the same objections will hold good against recognizing obstruction of the ducts of the submaxillary and of the sublingual glands as tumors. I prefer to consider these obstructions in this connexion.

*Obstruction of the Duct of Steno at its Orifice.*—Occasionally as the result of abrasion and consequent adhesion of the mucous membrane, at the point where the duct opens into the mouth, a small pellucid tumor is formed under the mucous lining, which, after a time, opens spontaneously, and a cure is effected.

*Obstructions of the Duct of Steno in its continuity, from Adhesions caused by Wounds, Ulcerations, Gangrene, etc.,* causing in some cases a temporary elastic, oblong elevation, on the side of the face; but the saliva soon makes away for itself, through the unsound tissues, and causes a fistula upon the side of the face, which is exceedingly difficult to close. There is, perhaps, no better plan than to pass a pretty large silk seton through the orifice of the fistula into the mouth, tying its two ends upon the chin; after the lapse of two or three weeks, it may be removed, and the fistula closed externally, by freshening its edges and uniting them with silver sutures.



*Encysted Tumors from Calculi in the Duct of Steno.—*

These tumors present themselves as hard, oblong nodules on the inside of the mouth; the presence of the calculus having sometimes caused inflammation and adhesion of the walls of the duct, so that the sac contains saliva and pus as well as the calculus.

These calculi are generally composed of the phosphate of lime, with a triple phosphate.

They must be laid open and the calculous removed from the inside of the mouth, so as to avoid a salivary fistula.

*Encysted Tumors Caused by Obstructions of the Ducts of the Labial, Buccal, Lingual, Pharyngeal Glands, and Follicles of the Mouth.—Anatomy of the Glands.—*The labial, belonging also to the system of salivary glands, are situated beneath the mucous membrane covering the orifice of the mouth, and especially the inner surface of the lips.

They are rounded in form, and of about the size of a small pea, opening by minute orifices upon the surface of the mucous membrane.

The buccal glands, similar to the labial, but smaller, are situated between the mucous membrane and buccinator muscle, except two or three called molar glands, which lie between the masseter and buccinator; these latter are somewhat larger than the submucous buccal glands, and their ducts open opposite the last molar tooth.

There are also a few small glands of the same character under the mucous membrane of the posterior half of the hard palate; those of the under surface of the soft palate are larger and more numerous.

Those of the tongue (lingual) are chiefly on the posterior third of the dorsum, and a few are found along its edges, and at the tip.

In the pharynx, especially at its upper part, these glands are numerous.

In addition, the mucous membrane of the mouth is supplied with numerous simple and compound mucous follicles:

they extend over the entire surface of the tongue, but are most numerous at the posterior portion.

The tonsil, situated between the two pillars of the soft palate is composed of lacunæ and closed vesicles, embedded in connective tissues and vessels. The secretion is a viscid mucus, designed to lubricate the food in its passage through the fauces.

*Diagnosis and Treatment.*—Encysted tumors of the labial glands are of frequent occurrence, presenting themselves as small, round, vesicular elevations, with semi-opaque walls, seldom attaining a greater size than a small pea, and containing a thin transparent, or nearly transparent muculent fluid.

They are often ruptured spontaneously, but in that case they generally reappear very soon.

Simple puncture and evacuation of the contents is generally followed by the same result.

Excision is therefore the only reliable resource. This may be practised by seizing the vesicle, with a small portion of the adjacent tissues, and excising the whole with a pair of scissors. In some cases I have found it necessary to remove the entire gland, the removal of the expanded duct being followed by a renewal of the cyst.

Very recently I have had occasion to remove a cyst formed in one of the buccal glands; but the remaining muciperous glands of the mouth and pharynx, seldom become sufficiently obstructed to cause tumors; or if they occur, it is probable that their walls easily give way, and a spontaneous cure is affected.

When they occur upon the tongue, as happens now and then, especially near the middle of the dorsum, it is not advisable to attempt their extirpation. A case was reported very recently in which an operation made for the removal of an encysted tumor of the tongue proved fatal. They should be treated by incision and injection. Indeed this observation applies to all simple encysted tumors which may form in the mouth, and remote from the orifice.—*Medical Gazette.*

## ARTICLE VI.

*New Anæsthetics.*

## BROMOFORM, BROMAL AND IODAL.

*Bromoform* possesses analogous physiological properties to *Chloroform*, and *Bromal* and *Iodal* produce in the animal organism similar effects to those caused by *Chloral*.

To prepare *Bromoform*, we make at first the *Bromal*, and combine it with the base. The formula is:



The liquid obtained by distillation between 50 and 65° presents chemical and organoleptical properties perfectly analogous to *Chloroform*, so that it could be mistaken for it with the difference that *Chloroform*, mixed with *Iodine*, gives an azure light violet color, whereas *Bromoform*, mixed with the same metal, gives a most beautiful red carmine. A dog was allowed to inhale a small quantity of *Bromoform*, which produced complete anæsthesia. He could be pinched and pricked without feeling it. The pupils were enormously distended. *Bromoform* produces anæsthesia when given in very small quantities, without producing a profound or a dangerous sleep.

*Bromal* differs from *Chloroform* only in that, that the *Chlor.* is replaced by the *Brom.* Its formula is  $\text{C}^2\text{HBrC}$  and to chrySTALLIZE it we must make the hydrate:  $\text{C}^2\text{HBrC} + \text{H}^2\text{O}$ . During all the time Dr. R. experimented with it there was a great discharge from the eyes and nose.

*Iodal* is prepared by mixing the *Iodine* with a quantity of alcohol and azotic acid, producing thus, also, *Iodoform* and a formiate. Like *Bromal*, it effects lachrymation. 5—grains injected into the rectum, produced anæsthesia, followed by convulsions and death. The blood was black, the muscles more red than usual; the mesenterium, the brain, and the medulla spinalis congested. The breath of the dog smelled strongly of *Iodal*, proving that it became only partially decomposed in the body.—*Dr. Rabuteau in L'Art Dentaire*

## MONTHLY SUMMARY.

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*the Man who may be Expected to live Long*—He has a proper well proportioned stature, without, however, being too tall. He is rather of the middle size, and somewhat thick set. His complexion is not too florid; at any rate, too much ruddiness in youth is seldom a sign of longevity. His hair approaches rather to the black than to the black. His skin is strong but not rough. His head is not too big; he has large veins in the extremities; his shoulders are not rounded rather than flat. His neck is not too long; his abdomen does not project; his hands are large but not deeply cleft. His foot is not thicker than long; and his legs are firm and round. He has a broad, arched chest, a strong voice, and the faculty of retaining his breath for a long time without difficulty. There is harmony in all his parts. His senses are good, but not too delicate; his pulse is strong and regular. His stomach is excellent; his appetite is good, and digestion easy. The joys of the table are not to him of importance; they tune his mind to serenity, and his soul partakes in the pleasure which they communicate. He does not eat merely for the sake of eating, but each meal is an hour of daily festivity. He eats heartily, and has not too much thirst—the latter being always a mark of rapid self-consumption. He is serene, loquacious, active and susceptible of joy, love, and hope, but insensible to the impressions of grief, hatred, anger, and avarice. His passions never become violent or destructive. If ever he gives way to anger, he experiences only a useful glow of warmth, an artificial and gentle fever, without an overflowing of the bile. He is fond also of employment, particularly calm meditation and agreeable speculations. He is an optimist, a friend to Nature and domestic felicity. He has no thirst after honor or riches, and banishes all thoughts of sorrow.—*Hufeland. N. Y. Medical Journal.*

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*Hiccough*.—In the *London Lancet* is reported, by Dr. John Brown, a case of hiccough complicating pneumonia, which resisted for days various treatment and strongly threatened the patient's life, but was immediately relieved by injection of solution of opiate of morphia into the intercostal region.—*Half-yearly Journal of Med. Sci.*

*Aconite and Muriate of Ammonia in Neuralgia.*—in the Chicago *Medical Examiner* for November, Dr. J. T. Newman confirms the usefulness of aconite and muriate of ammonia in ovarian neuralgia. The prescription he gives is

R Ammonia muriatis. . . . . 3 ij.  
 Tr. aconiti . . . . . f 3 ij.  
 Syrup aurantii cort. . . . . f 3 viij. M  
 S. Teaspoonful three times a day.

## BIBLIOGRAPHICAL NOTICES.

*Manual of Discovery, Manufacture and Administration of Nitrous Oxide or Laughing Gas, in its Relation to Dental Minor Surgical Operations, and Particularly for the Painful Extraction of Teeth.*—By F. R. Thomas, D.D.S. Published by S. S. White, of Philadelphia. This is a 12 mo. volume of 128 pages, the perusal of which will be productive of good results to all practicing dentists. It is a plain and practical manual of the manufacture and administration of Nitrous Oxide, and condensed as to render it serviceable to every one in the profession. It is gotten up in the usual neat style of the publisher.

*Webster's Dictionary.*—Among our correspondence we find several letters of inquiry in regard to the best work of this kind for a library. The following is the opinion of the Hon. John Motley, the Historian, and now minister at the court of St James concerning Webster's Unabridged Dictionary: "It has been, common with other great lexicons of the English language, one of my daily companions. My testimonial to its erudition, to the accuracy of its definitions, and to the vast etymological researches by which it has been enriched through the labors recently bestowed upon it, can hardly be of much value, sustained as this book is in world-wide reputation, by so general an approbation. I have no hesitation in expressing my sense of its merits."

*Transactions of the Sixth Annual Session of the Illinois State Dental Society.*—A volume of 116 pages recording the proceedings of the meeting held at Bloomington, Illinois, May 10th, 1870.

## EDITORIAL DEPARTMENT.

*The Nashville Meeting.*—The tenth annual meeting of the American Dental Association held last month in Nashville, Tennessee, the proceedings of which we present to our readers in the present number of the Journal, was a very interesting one, the major

of the members of the profession present being from the South and West.

Dr. W. H. Morgan of Nashville, whose name is a familiar one throughout the South, was elected President, a position he was fully entitled to years ago, and with which he has now been honored by the votes of those who appreciate his labors in behalf of Dentistry, without regarding political opinion and residence objectionable features, as has been the case heretofore.

The following letter exposes some sharp practice at the close of a meeting, similar to that in which the delegates to the political conventions of our country are wont to indulge in. It is scarcely necessary to remark that the Southern members were not the perpetrators in the "wire working."

*Nashville, Tenn. August 15th 1870.*

Editor American Journal of Dental Science :

Dear Sir: For fear every body don't know that we are interested in dentistry down here, I send a few lines for your Journal, hoping they will inform every one that we are. If every one had attended the dental meetings, and heard the dental speeches, and dental talk, and dental manoeuvrings we have had here, and were about lately, they would certainly think we had dentistry in the brain.

Our Tennessee Association met at Murfreesboro, about thirty miles from this place, on the 28th of July. We had a most excellent meeting—one of the most interesting we ever had.

This city (Nashville) was chosen as the next place of meeting, and as officers, Drs. C. P. Baird, President; H. M. Acsee and A. Hartman, Vice Presidents; S. H. Beard, Corresponding Secretary; R. Freeman, Recording Secretary, and Treasurer. The next meeting will commence on the fourth Thursday in July, 1871. Now comes the American Dental Association, about one hundred and thirty strong, to hold its tenth annual meeting, the first ever held south of Mason and Dickson's line, in the representative Hall of our Capitol, a most excellent place for the occasion. Commencing August the 2nd at 10 A. M., continuing sessions two a day, for four days, during which time we had a good deal of very pleasant and interesting discussion, as well as many other things done and said, calculated as we thought and hoped to beget a very pleasant state of affairs betwixt the two sections of country. We began to feel that our labors for the past three or four years had not been in vain, that another meeting or two in the heart of the South would beget such a feeling and interest that nothing would shake it off, especially as we had selected, when all were present, Atlanta, Ga. for the next place of meeting. But unfortunately some few things occurred that we fear will spoil the whole. Just before adjourn-



ing, when a good many had gone home, and many others who had not were absent, a motion was made and pushed through for the purpose of reconsidering the vote making Atlanta the next place of meeting, and fixing Niagara Falls instead.

After this very ungenerous as well as unfair thing had been done, and things began to look a little stormy, some of the better thinkers concluded another reconsideration would be in order and such a motion was made and carried, resulting in a move from Niagara to White Sulphur Springs, Va. The compromise we fear will not have that effect that many seem to think. To say the least, we have our doubts about reinstating the feeling that existed before the motion was made to remove from Atlanta.

We have labored, as many others have done, for several years to make this society truly national, but we must confess at present we feel that all has been done in vain, we hope, however, that our feelings may not be realized. While we trust that something else may be done to interest the South in this society, we are satisfied that our first as well as most golden opportunity has been lost. Atlanta would have given us fully one hundred representative men of the South, to have joined shoulder to shoulder with the North in trying the great national Dental wheel science at the next meeting. As it is we fear, the present plan in the South, as it may be called, will not add one fourth or fifth that number. The whole thing is chargeable to a few individuals."

*Dr. W. W. H. Thackston.*—We are pleased to learn that this gentleman, one of the most eminent practitioners of dentistry in the South, has been elected Mayor of Farmville, Virginia, where he has long resided. Dr. Thackston is one of the early graduates of the Baltimore College of Dental Surgery, of the class of 184

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## OBITUARY.

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*Dr. Thomas Nash Reed.*—With deep regret we announce the death of Dr. Reed of Danville Va. by the rail road accident last month near the Green Briar White Sulphur Springs.

Dr. Reed was a native of Charlotte Co., Va., was educated at Hampden Sydney College, and a graduate of the Baltimore College of Dental Surgery of the Class of 1866. He was a gentleman of fine scholastic attainments, and possessed a very remarkable degree of mechanical ingenuity and inventive faculty. The intercourse of the Faculty of the Baltimore College of Dental Surgeons with Dr. Reed led them to think highly of his integrity and moral worth. Under a modest and unassuming exterior, concealed abilities which would have given the profession reason one day to be proud of him.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.     THIRD SERIES--OCTOBER, 1870.     No. 6.

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ARTICLE I.

*Inflammation of the Gums.*

By J. P. H. BROWN, D. D. S.

Read before the Georgia State Dental Society.

There is no portion of the mucous membrane of the mouth of which the dentist is called upon to treat, that taxes his skill and remedial resources more than inflammation of the gums.

As they are connected with the alveolo-dental periosteum and alveolar processes, and immediately contiguous to the teeth, they are at all times liable to be affected by any morbid action existing in these parts, moreover, being composed of thick, dense mucous membrane, which is the same tissue that lines the mouth, lungs, alimentary canal, and in fact, all the cavities and hollow organs which communicate externally by different apertures on the skin, and being endowed with a high degree of vascularity, it may well be supposed that their condition of health is also influenced to a very great extent by certain constitutional tendencies.

It is impossible in a short paper to discuss all the pathological conditions of the gums. This would require a volume. I shall only consider those phases of inflammation usually known by the terms *acute* and *chronic*, and which constantly



occur in a dental practice. I lay no claim to any new or wonderful discovery, or infallible mode of treatment, but will describe the course of practice which has been the most successful in my own hands.

The physician has more to do with acute inflammation of the gums than the dentist. Active inflammation of the gums does not always commence within their structure, but is sometimes the result of lesion of the adjacent parts; as for instance in *follicular stomatitis*, a disease confined mostly to young children. Here the disease commences in the mucous follicles of the tongue, fauces and inside of the mouth and the gums become affected sympathetically.

The only forms of acute inflammation of the gums that come more especially within the practice of the dentist are *ulcerative stomatitis* and *mercurial action*.

In *ulcerative stomatitis* the gums are attacked first, and the ulceration often progresses to such an extent as to lay bare the roots of the teeth. Dr. Tanner, when speaking of this disease in his "*Principles of Medicine*," observes: "On looking into the mouth we shall see that the gums are swollen, red or violet colored, readily bleeding to the touch, and covered with a layer of pulpy grayish matter. If the disease be allowed to creep on unchecked, the gums will get destroyed by the ulceration, and the teeth become exposed and loosened until they fall out. The morbid action also spreads to the inside of the cheeks, which become covered with irregular sloughing ulcerations; and the tongue assumes a swollen and sodden appearance. Ulcerative stomatitis is not uncommon; it occurs from the most part in weakly children who have been badly nourished, and exposed to cold and damp.

"The treatment of this disease is not difficult, inasmuch as we possess in the chlorate of potash a remedy which may almost be deemed a specific. Five grains of this salt may be given every four or six hours to an infant one year old, in a little sugar and water. When the ulcerations have healed, bark or quinine should be administered."

Local treatment is regarded in this disease of secondary importance. Nitrate of silver may be applied to the ulcers, which will change their character and relieve the excessive tenderness. A weak solution of carbolic acid applied as a wash will suppress the offensive odor. All necrosed teeth and roots which are a source of irritation should be extracted, and all collections of tartar removed.

In acute inflammation of the gums caused by mercury, the first appearance of the trouble is indicated by a peculiar tenderness and swelling of the gums, and by an increased secretion of mucus and glandular fluids into the mouth. These symptoms rapidly increase, and are accompanied by a very disagreeable odor, and a metallic taste in the mouth. If the use of the mercurial preparations is continued, these symptoms become very much aggravated. The gums become greatly swollen and covered with ulcers, the salivary glands become greatly affected and pour out an excessive amount of secretion, and extensive sloughing of the soft parts and bones sometimes occurs. In the treatment of mercurial salivation great benefit has been derived from the use of chlorate of potash. Mild aperients, combined with a well regulated diet and fresh air, must be resorted to. The local applications should consist of astringent and detergent washes.

*Chronic inflammation* of the gums is a disease for the relief of which the assistance of the dentist is generally sought, and to a description of which I shall confine the remaining portion of this paper.

In this form of inflammation, the gums are usually of a livid red appearance, soft and spongy, and bleed upon the slightest touch. Their surface when closely examined is found to be minutely nodulated, and the secretion of epithelium increased; the papillæ are abnormally prominent, and the substance of the gum around and between the teeth is thickened and enlarged. In some cases there is so much enlargement of gum that crowns of the teeth may be nearly or entirely covered, rendering the process of mastication nearly impossible.

In the treatment of this disease it is of the utmost importance to get at the cause of the difficulty. If the cause is local, that is, arising from the presence of diseased teeth, roots, tartar, &c. these irritants should at once be removed. If the gums are very much enlarged with great prominences between the teeth, the enlarged portion should be cut away with a lancet or a sharp scaler. Scarification will do good at all stages of the disease. After the bleeding has somewhat subsided, the inflamed surface should be touched with a pointed stick of nitrate of silver. Though I have found better results to follow (and much prefer) an application of a mixture of equal parts of creosote and tincture of iodine applied with a camel's hair brush. It is always best to alternate these caustic applications with an astringent and alterative wash, such as a decoction of red-oak bark, tincture of arnica, or a weak solution of sulphite of soda or chlorate of potash.

There are many cases where the trouble is more constitutional than local. In these cases the gums seem to be the point where the hidden lurking poison in the system shows itself. This poison may be mercury, scrofula, scorbutus, or, perchance, some syphilitic virus that has been poisoning, as it were, under ground for several generations. It may also result from disordered digestion, or from a general weakness of the system. In all such cases local applications will prove of little benefit unless the system be toned up and invigorated by general treatment.

There is another form of chronic inflammation of the gums where the disease is accompanied by a wasting away of the alveolar processes, and the gradual recession of the gums from the teeth. This form is the most difficult to treat, and often resists most obstinately all the treatment and means the dentist can bring to bear against it. It usually commences in the gums around a single tooth, or it may attack the gums of the whole denture.

Those persons with a scorbutic or rheumatic diathesis are more subject to it than others. We find the tendency to

this disease to run in families. I know of a mother who lost all her teeth by this disease, and three of her children who have inherited her constitutional predisposition have the same disease in their gums. But this is not all. In the mother's case the disease commenced around the left lower central incisor, and in her children the disease made its appearance around the identical tooth.

Tartar and dead teeth are not the sole cause of this disease as many suppose. They only irritate and keep alive the morbid susceptibility (if I may so speak) existing in the gums. Furthermore, the tartar that is deposited deeply down toward the apex of the root is no salivary deposit at all, but a formation or precipitate from the secretion thrown out by the diseased gums. This tartar has a dark greenish appearance—sometimes tinged with yellow—and presents a nodular formation. It has altogether a different appearance from salivary calculus.

When the disease first makes its appearance in the gum around a single tooth, the gum often at first presents a sort of ulcerous look. It is a bright red, but soon changes to a more livid color. The alveolo-dental periosteum also being implicated in the morbid action, the edge of the alveolus disappears, the gum sinks down, the tooth becomes loose, and by slow degrees loses its implantation and falls out. Tooth after tooth in this manner may be lost.

The predisposing cause of this form of chronic inflammation of the gums is unquestionably a constitutional susceptibility of the gums to morbid action. The exciting causes are necrosed teeth and roots, tartar and foreign deposits around the teeth irregularity and pressure of the teeth, badly fitting plates, and the effects of mercury. An artificial denture that does not fit when applied to a mouth with these irritable gums is apt to keep up the disease, and there may be a slow wasting of the alveolar ridge until it is very much absorbed. The gums over this absorbed portion are thick and soft—feeling like a mass of thick flesh.

The great majority of patients suffering with this disease

not only require judicious local treatment but also general treatment. In fact, without the latter the former will prove of little benefit. Every means should be used calculated to correct, improve and invigorate the general system. The diet should be nutritious ; and embrace more fruit and vegetables and less animal. All salted meats should be eschewed. The most difficult cases to cure we always find among those whose habits of life are not correct—who drink and dissipate. The local treatment should be pretty much the same as that for the common form of chronic inflammation. But it must faithfully be kept up if we expect success. The creosote and iodine mixture alternated in its use with sulphite of soda, tannic acid, &c., can not be too highly recommended. Every particle of tartar, all dead roots, and loose teeth that will not tighten and are of no service should be removed. In rare cases it may be very desirable to retain some teeth that are very loose. This can sometimes be satisfactorily done by wiring them to those that are firm. Loose teeth have been retained in this manner so as to be servicable for many years.

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## ARTICLE II.

### *Complicate Fillings.*

By M. S. DEAN, D.D.S.

Read before the Illinois State Dental Society.

We are becoming daily more strongly convinced that many failures occur in our operations upon the teeth which might have been easily prevented had complicate fillings been resorted to instead of simple ones.

By complicate fillings we mean such fillings as combine two or more simple fillings in one.

In opening this subject for discussion, (for this is the chief object of this paper,) I shall attempt merely to direct attention to such cases in practice as seem to indicate complicate fillings, and offer some suggestions as to the preparation of such cavities and the proper mode of filling them.

In the first place, I will direct attention to the bicuspid teeth, for in these such fillings are more frequently required. We often find small cavities in the anterior and posterior pits connected by an almost imperceptible fissure, and sometimes instead of this fissure a roughened appearance of the enamel, threatening disintegration, though, as yet, showing no visible evidence of decay.

In the case with a slight fissure, I would open it to the depth of decay, or in case the depth is not sufficient to admit a strong band of union, cut a little beyond the depth of the decay; then, in my retaining pit in the anterior cavity fasten a strip of heavy foil, (say 30 or 60) and carry it over to the pit in the posterior cavity. By this means we may fill the fissure if there be no undercut, so securely that it cannot be removed without displacing the gold in the anterior and posterior cavities, and save, frequently, more of the strength of the tooth than we could otherwise do. When, instead of this fissure, we find roughened enamel, which we know must yield sooner or later to destroying agents, and which cannot be cut or polished out without removing too much of the tooth substance, we would treat the case as if decay had already commenced.

Again, take the tooth which we have just filled, and suppose there be in addition to this complicate cavity, one in the posterior approximal surface. Now, unless the enamel on the posterior ridge be very perfect, and unless the coronal wall of the cavity be so strong that it will not be liable to break down even by hard usage, I would, by all means, before filling the complicate cavity on the grinding surface, cut away the posterior ridge and unite them all in one; and this I would do if there was already room to approach the posterior approximal cavity. But, if there was not room, and the cavity a very large one, I should, even though the coronal wall appear sufficiently strong, drill through from the cavity in the posterior pit into this cavity; then with chisels cut away the margin and unite them all in one, thus making a direct opening into the posterior approximal cav-



ity, which would greatly facilitate the operation, and render it *possible* to make a perfect filling at the point where the greater number of failures occur—the cervical margin.

If, again, there was an anterior approximal cavity in this same bicuspid, I would treat it (other things being equal,) the same as the posterior one, making of them all one complicate filling.

Let us again, for example, take this same tooth, and suppose it to have been left a year or two longer before it was filled. Now the buccal and palatal wall of the approximal cavities have lost their supporting dentine; decay has advanced beyond the margin of the gums and extended into the neck of the tooth, and is in dangerous proximity to the pulp, which is sensible to thermal changes. If we fill one of these approximal cavities singly, we must depend upon a small retaining point at the cervical wall, and upon the slight concavity of the enamel which forms the buccal and palatal walls, and perhaps, the overhanging posterior ridge, for we cannot drill other retaining pits without endangering the pulp. Should we succeed in filling such a cavity without fracturing the walls, the filling could not be of long duration, the walls would soon crumble away and the filling drop out. In such a cavity it might also be highly important to cover that portion nearest the pulp with some nonconducting material, which would render it still more difficult to secure the filling. In the above, and like cases, complicate fillings are most strongly indicated, which should extend from the anterior to the posterior approximated cavities. And although I should not destroy the symmetry of the tooth unnecessarily, I should remove the buccal and palatal walls until I found them sufficiently strong to promise durability, and drill my retaining pits horizontally or perpendicular, or both, from or near the grinding surface. One or more pits are absolutely necessary at the base of the cavity near the cervical margin. After this complicate cavity is prepared and ready for filling, we should commence with the posterior cervical pit, and fill this carefully with No. 30 foil—carefully, for a

careless blow might split off the thin wall of this retaining pit, or the instrument misdirected might pass between the root and the rubber dam. Now, fearing this slight point might be broken or loosened by the repeated blows from the mallet, should we attempt to build up the filling upon it unsupported by others, it will be safer to fill the nearest pit or pits and join them together with heavy foil; then commence at the base of the cavity, using small pellets or small pieces of heavy foil, whichever can be manipulated the most readily, and with a small foot plugger with the point extending over and slightly beyond the cervical margin, build up the filling, but before it is finished the filling in the anterior approximal cavity should be so far advanced that they may be firmly bound together with strips of heavy foil. The work has now become simple and the mode obvious; and I will merely add that if either or both of the cusps are pointed and not very strong, I should consider the safety of the tooth better secured if they were filed down and covered with thick foil, as otherwise there would be great danger of their being split off in masticating hard substances.

Now, gentlemen, we will take for an example the first superior molar. We find cavities in the central and posterior pits, and a posterior approximal cavity. From the posterior pit a fissure leads over the palatal surface, extending to within a line of the gum and terminating in a small cavity. From this fissure on the palatal surface, one leads off, following the dividing seam which separates the anterior depressed cusp from the anterior palatal cusp.

Now, if the ridge which separates the central and posterior pits be not strong and perfect I would make one cavity of these. If the coronal wall of the posterior cavity be not already broken, I should remove that portion which divides the cavity in the posterior pit from the posterior approximal cavity. Then with a file suitable for that purpose open the palatal fissure; then with a drill, properly prepare the palatal cavity, and drill out the fissure that leads around the anterior depressed palatal cusp. In this latter work espe-



cially, we find GREEN's Pneumatic Engine invaluable. Having prepared this complicate cavity, the filling should be commenced in the retaining pit in the cervical margin of the approximal cavity, uniting it as soon as necessary or convenient with the cavity in the posterior pit, taking care not to clog up the avenue to the base of the filling, and then continue as detailed in filling the posterior approximal cavity of the bicuspid. Before this is completed, however, I should fasten a strip of heavy foil in the posterior cavity, and lead over to the cavity in the palatal surface. From the palatal cavity, with a strip of heavy foil, follow around the depressed cusp until I came to the terminus of the fissure, where I should fasten it in a properly shaped retaining pit. It will be needless to detail farther the mode of filling this complicate cavity. Such cavities are not uncommonly found in practice; indeed, during the past week I have filled eight of this character which would answer very well the description here given.

It will not be necessary for me to go into a detailed description of the complicate cavities in the lower bicuspids and molars, as the same principles apply to these, with a little variation in practice. There is, however, a certain class of under molar teeth where the enamel upon the entire grinding surface is found very imperfect when they are first erupted, of which I will say a word. Here the enamel is uneven or convoluted, as if imperfectly fused. If disintegration has not actually commenced in these, I would polish out the roughness; but if, as is commonly the case, we find a lingual and labial fissure, also small cavities already formed in different portions of the grinding surface, not well defined, but with the fissures branching off in various directions, I should cover the entire surface with a complicate filling. In some parts the complicate cavity would be of slight depth, in others deep enough to make good strong retaining points. This class of teeth is by no means rarely to be found, at least in large cities.

I will say further in regard to the first lower molars, that

they are about the worst abused teeth in the whole dental family. We often find one of the pits on the grinding surface filled with a little round plug of gold, and fissures leading from it in every direction. These fissures, however small they may be, should be followed up, and, *generally*, if a slight ridge interpose between them and other cavities, it should be cut away, and every fissure should be made of sufficient depth and width to retain the gold securely.

One word in regard to complicate fillings in the incisors and cuspids, and I am done, for I would not by exhausting the subject, deprive you of that pleasure, even if I could.

In these teeth, when worn down from occlusion (as is most often the case when grinders have been lost), we may find cavities in the approximal surfaces, which, from the wear of mastication, would, when filled as simple cavities, be soon broken and the fillings dislodged. In cases of this kind, it would be better to cut through the wall at the cutting edge, (or what has really become the grinding surface) and form a groove with under cuts or pits, then, by carrying the foil through this channel from one approximal cavity to the other, build upon or cover the grinding surface as the necessities of the case may require. This is a single operation, and the mode of proceeding and its advantages are obvious, and doubtless familiar to you all.

And now, gentlemen, without supposing for a moment that I have offered a single new idea to this society upon the subject of complicate fillings, I have performed the duty assigned to me by the Executive Committee to the best of my ability.

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### ARTICLE III.

*Proceedings of the American Dental Association.*

(Concluded.)

Dr. Kulp. It was always his opinion that a mother could give her children good teeth. He cited a case where a lady had had several children with bad teeth. But seven years ago he had taken her under treatment, and since that

time she had had three children born, who were in better condition with regard to teeth.

Dr. Crouse would like to know the condition of the mother with the first and second child.

Prof. Stellwagen. Does the gentleman mean physiologically? Worse with the second than the first.

Dr. Crouse thought there was little difference whether bolted or unbolted flour was used. He thought cow's milk could not be too rich and did not need any additional water for food for infants.

Prof. Stellwagen. What is the proportion of water in cow's and human milk? Is it not greater in the latter? and will not the former be too rich for their delicate digestive apparatus?

Dr. Crouse could not say, but he thought pure milk none to good for babes.

Dr. Walker. We have had light, and good light. I believe the time will come when children will be raised with good teeth. I think local habits have more to do with it than climates. Scrofula has been spoken of,—where do we get our word scrofula? It is from scrofa, a sow; this is why the negroes have worse teeth than the whites. The people spoken of with good teeth are free from this disease.

Prof. Stellwagen. Do the Israelites have better teeth than Christians or those who eat pork?

Dr. Walker. Yes; and this is why the God of Abraham forbade the use of pork.

Prof. Stellwagen. The gentleman's experience is very different from mine. Some of the worst teeth I have ever had under treatment were in the mouths of strict Israelites.

Dr. Peebles' practice is among many of the Israelites; they have worse teeth but do not take so much care of them. He had come in contact with the Indians also, and the young Indian had bad teeth. The exhumed skulls of Indians examined also had defective teeth. Those living at the time examined may have fed upon fine flour, but the exhumed could not have had bolted flour. With the negroes

he found they had better front teeth, but worse molars.

Dr. Forbes. It has for many years been asserted that the teeth of Americans are far inferior to those of Europeans; he would take exceptions to this. He at one time had examined the mouths of aborigines; he had learned from one old lady who had had much experience with Indians; she said some tribes had worse than others. He thought Europeans had worse teeth than Americans. He had the report of a German lady that had examined the teeth of her relatives in Germany and they were worse than hers. Another lady had asked him why American dentists were the best, if it was not from the demand for them; and in answer he told her that she was not educated to know how bad her teeth were. He was proud to say that the American women were so much better looking, especially about the mouth. In Europe a lady would be considered disgraced to have it known that a tooth was filled. He considered it far more reasonable to have a tooth jeweled than the ears or nose. As a rule, the Irish in their own country have better teeth than the Americans. But they generally drop out at forty. It had been said that it was criminal to extract a tooth under any circumstances. He would not assent to this,—it was the most consummate falsehood. How about treating teeth and not losing one? He had suffered from operations by those who claimed never to have lost a tooth, and now had but few left.

Dr. Cobb thought that Dr. Allen's paper, with regard to food, was instructive; but how could we practice what he advises? He feared we did not live as we ought to live; he comes with an instructive paper, but does not live as he advises. He wants to see people practice this. He thought it the duty of the dentist to attend to the hard structures and let the physicians attend to the others.

Dr. Allen meant that in early life he did not use brown bread, but now he does always, and his children have never had a tooth extracted, so far as he knows. He lost his teeth from sickness and ignorance in the abuse of calomel.

Dr Walker thought the time would come when extracting teeth would be a crime.

Dr. Dennis. An epitaph was brought to his mind by these discussions—

“I was well, wished to be better, and here I am.”

We will adjourn to the tea table and eat as before. Consistency is a jewel, but it is as rare as the most precious.

Prof. Taft. Dental chemistry is simply vital chemistry. This subject is broad, and the overlapping of these subjects, vital chemistry, physiology, and pathology, has been the cause of the rambling. He took exception to the remarks of Prof. Cutler, with reference to crowding the system with one kind of food and depriving it of another. At all times during life the phosphate of lime is required; he does not believe that the system will take up more than required. That the bones will be solidified by an increased amount of mineral material in the food, he thinks a fallacious doctrine.

Prof. Bogue. There is one point that may be brought in, that of discoloration of dental tissues. This may be due to hæmatin, iron, or one or both, if it exists within the dentinal tubuli. He conceived it due to oozing of the contents of the blood globules into the dentinal tubuli.

Dr. Forbes thought the salubrity of the Irish climate was most perfect, and he wondered they did not live forever. The meat took the place of bread; in many cases, when used as food, furnished the required amount of mineral substances.

Adjourned.

### THIRD DAY.—*Morning Session.*

The meeting was called to order at 10.05 A. M., August 4, by the President. After prayer, the minutes were read and approved.

Dr. Cushing, Chairman of the Committee on Operative Dentistry, read a very able report, which noticed the recent improvements in this branch, praising the rubber dam, and the generosity of Dr. Barnum, in giving the result of his invention to the profession,—reviewing the subject of adhesive gold, and the use of heavy foils, which it favored;

finally calling the attention of the profession to some of the labor-saving machines for excavating, filling and finishing.

Prof. Knapp then read two papers:—"The Saving of Time in Dental Operations," and "Cylinders—the Method of Making and Using them."

He recommended the operator to provide himself, for making cylinders, with a desk having a velvet top, a box divided into small compartments for holding different sizes of cylinders, an ivory paper-folder, a Swiss broach, upon which to roll the gold, the end being broken off and sharpened, and a pair of foil shears.

He had used many numbers of gold, from 2 to 30, but preferred Nos. 4, 5, and 6. When very large and long cylinders are needed, an entire sheet of No. 4 may be used; but for smaller, the sheet is cut into strips before folding.

To fold into strips or tapes, he first lays the piece of gold of the size required upon the velvet-covered top of an ordinary writing-desk, and then indents with the edge of the paper-folder, and folds gently. The tape is then placed on the inside of the forefinger of the left hand, the hand being turned with the palm up, and the end of the strip almost to the end of the finger. The broach is taken up by the right hand and laid upon this end of the tape, and the gold rolled upon it by closing down the thumb of the left hand and drawing it backward toward the first joint of the forefinger. The rolling of the cylinder is completed by twisting the broach, thus once started, with the thumb and forefinger of the right hand. For very short cylinders, the tapes may be made by folding the sheet of gold and then cutting into very narrow strips with the foil shears. When the rolling of the cylinder has been completed, a few more turns may be given with the nail of the left thumb pressed against one end of the cylinder.

He claimed that the method described originated with Dr John H. Clark, of New Orleans, and referred to the *American Journal of Dental Science*, vol. i. p. 23.

Some cylinders may be made larger at one end than the

other, by folding the tape so that one of the sides is thicker. For filling pulp canals, the breadth of the tape is made almost equal to the length of the canal, and one end is folded to within a short distance of the other; then the end which has been made by the doubling is carried nearly to the end first folded down. This doubling up of one end is continued until the length of the canal to be filled is obtained and the gold presents a series of slight steps, the first being the thickness of the tape, the second double, the third quadruple, the fourth eight times, and so on, duplicating. The broach is then put on at right angles to these folds, and the whole is rolled into a tapering horn with the smooth sheet of tape outside and the doubled steps inside.

The method of filling consists in closing up the crevice by small cylinders stood on end, and then arranging others parallel with these around the walls, so that the ends project out about one-third of the whole length of the cylinder. They are flattened and partly condensed against the wall by lateral pressure. Others are then placed around within these and similarly worked. The largest are rolled soft and used first, while the small hard ones are for finishing, keying all together in the small holes pierced by longitudinal pressure on the cylinders with wedge-pointed instruments. He spoke of the three edged hatchets and hoes he uses for excavating, and the wedge-pointed pluggers for filling with cylinders.

A paper by Prof. Frank Abbott, of New York City, "Light versus Heavy Gold Foil and Crystal Gold," was read.

Prof. Knapp. The paper just read advocates invariably the use of soft gold. The perfection of the filling, whether it be hard or soft gold, depends most upon the manner in which it is introduced.

Dr. Peebles. Two facts are called to our attention by the reading of these papers. Prof. Knapp gives the credit of introducing cylinder fillings to Dr. Clark, in 1850. Dr. Spalding, of St. Louis, once claimed priority, and Dr. Ide, of Logan (now Columbus), Ohio, in 1839, had filled with

cylinders, and recommended it to be done as cigars are put in a tumbler. Dr. Parmly, of New York, when in Louisville, over forty years ago, had gold rolled, as he could not obtain foil, and used it for filling teeth. He wished these facts on record, since the use of the mallet was mentioned in Fitch's work on dentistry, long before it was introduced as original by another.

Dr. Carroll criticised the use of the terms "cohesion" and "adhesion." He understood the former to mean the attraction of the particles of any substance for each other.

Dr. Morgan believed Dr. Clark had the honor of introducing cylinder fillings, but he had examined some made in 1832 of cylinders. Dr. Badger claimed to have shown Dr. Clark the first cylinder filling. A gentleman here (Nashville) had a filling inserted in this way at the age of sixteen, and is fifty-four years old now.

Prof. Knapp gave Dr. Badger the credit of using cylinders, but the doctor admitted that he did not make the entire plug of them; he forced them into plugs on finishing.

Dr. Morgan. I have seen Badger operate, but never saw him use a strip.

Dr. Fouché said his preceptor, Dr. G. P. Norman, of Cincinnati, used cylinders in his presence in 1847-8.

Dr. Dickerman. Dr. Flagg instructed me, in 1842, how to make and use cylinders.

Dr. Walker. The same idea so often occurs to active minds that it makes but little difference who made the first cylinder. He found that he must have instruments with points to go over and over again every part of the cavity. Where a cavity is irregular, he tries to make it simple. On the approximal surfaces of the bicuspid he can get the best fillings with cylinders, but where there are irregular walls he uses soft foil or adhesive gold and mallets.

Dr. McKellops. The point to gain is that Dr. Clark was the first to put before the profession a description of how to make and use cylinders for filling teeth.

Prof. Bogue said: Under the head of Operative Dentistry



we may consider some points—how our operations may be made neater by keeping our fingers and nails clean, by avoiding the use of them in our hair, etc.; napkins should be kept in order, instruments clean and polished. He said Dr. Carroll had criticised the word “cohesion” meaning sticking “with,”—“adhesion,” sticking “to” any substance. Criticising the nomenclature of the profession, he thought we should drop “eye tooth” for “cuspid,” which is better. “Tartar” is an incorrect term when applied to “salivary calculus.” We often hear “destroying nerve,” “taking nerve out,” etc. spoken of, meaning “taking out *pulp*.” It is not to be doubted that cylinders will make a most perfect filling in many cases, and the microscope will demonstrate that. There are, however, some cases where crystal foil or gold is needed. *Teeth must be filled with judgement as well as gold*. He would no more abandon cylinder fillings than rubber dam. We must use all kinds, as the case requires.

Dr. Carroll thanked Prof. Bogue for the opportunity with regard to the criticisms of nomenclature. He differed on the Latin prefixes “co” and “ad.” “Co” he defines “with.” “Ad” means “to.” Now, soft foil is always cohesive, but is not adhesive.

Dr. Allport. I hold in one hand a letter with a stamp adhering to it; in my other hand is a fan,—the particles of the handle cohere.

Dr. Dennis. Adhesion is a union of unlike substances, cohesion the union of like substances.

Dr. Dean. Cohesive attraction holds together like particles of matter, or atoms of the same kind. Adhesive attraction exists between unlike atoms or particles when in contact with each other.

Dr. Mills eulogised the paper of Dr. Cushing, of Chicago. It was an important matter that we should pursue our practice without prejudice, and simply for the truth. We should spend more time, and examine closer into the preparation of the cavity for filling. He would as soon think of abandoning the rubber dam as to attempt to fill with cylinders, but ha

been much pleased with the views advanced. A remark was made by Prof. Knapp that he wanted to fill a difficult cavity, not a simple one. He thought much could be learned from simple cavities. The principles underlying filling must be studied, and difficult cavities reduced to simple ones. With reference to the number of instruments. He has used many to learn, and he thinks here is another governing principle. He has come down to a few, which he finds valuable. Varney has presented thirteen; he takes out four and gets along just as well as well as he did with all. His nervous temperament makes him try many. He agrees with Dr. Knapp as to the form of cavities,—the walls almost perpendicular.

The Recording Secretary read an invitation to visit the Tennessee Hospital for the Insane.

The invitation was accepted, with the thanks of the Society.

Dr. Crouse moved for an evening or a night session, to hold the election for officers and to determine the next place of meeting. Carried.

#### THIRD DAY.—*Afternoon Session.*

Committee of Arrangements reported list of new members and names of the members for the different committees.

Dr. Corydon Palmer took the floor, and stated that his subject was in continuation of that treated of last year. He desired to show how everything pertaining to the mouth may be made of use in practice. Every fissure in a tooth filled should be marked and the charge made immediately after the patient has been under the hands of the operator; they are both better able to judge of the amount of force expended, etc. He divided the mouth into four divisions.

First, he exhibited a drawing of a head divided into four by a perpendicular and transverse line; this gave an upper and lower right and left division. In making a record it is well to know how to note this,—L. Sup., L. Inf., R. Sup., R. Inf. divisions.

Second drawing gave the teeth, thirty-two in number. Commencing at central incisor, he numbers backward to

eight; in this way he has the teeth of the four divisions described by numbers; thus, the lateral incisor is No. 2, cuspid, 3, and so on to wisdom tooth, No. 8. The teeth thus become better known by their numbers than by their names. By the shape of the mark made he knows the kind of filling and the position on the tooth by its relative position on the number designating the tooth.

Almost every dentist has some sort of short-hand or way of abbreviating a description of the operation. The time to make these marks or memoranda is immediately after completing the operation. Demonstrations then followed. He said that he was sorry to see so much time wasted in making pellets, cylinders, etc. They are filled with animal matter from the hands; while pressing and squeezing them in, spring the cavity in the tooth, and cause a constant antagonism between the attempt of filling to escape and the tooth to retain it. Since 1860 it has been demonstrated by our prophet that a tooth can be built up, with all its cusps and fissures; yet there are some who will yet crowd gold into a cavity. No first-class operations can be made if the gold is handled with the fingers. In using soft foil, it don't make so much difference how you fill, so long as you can put it off; but in ten years or so take it out and it is offensive, and the animal matter in it will burn.

You need not fear cutting down crown surfaces or fissures for with adhesive gold this may all be replaced. Make the cavity thoroughly open, and put a mat upon the bottom, then build up packing toward the walls. This is first-class and anything short of it is short of the highest attainment in our science. It has been stated here to-day that the cylinders make the most perfect and solid fillings. It is not true—they will not do. Begin and build up solid from the bottom. Do not object to the heavy foils, but with No. 4, if you have proper instruments and operate correctly, you will obtain good results.

You must understand how to have your instruments right, and encourage our manufacturers. What is one of

two dollars for an instrument? The difference of a line will make an instrument unfit for use. Just pay them to put the talent in it; have the serrations fine. It is most essential to have a fine point. Don't put the instrument on with a nervous force or jerk, but steadily, and press it down, holding it tight; then with a lead mallet strike a following blow, and let it not spring off; this vibration is what hurts the tooth. You strike with a steel mallet, or wood, or bone, etc., and bounce it off, but with the lead you hold the instrument until after the blow dies away.

In a recent case of atrophy with ridges and pits, I used the rubber dam and immediate wedging; had an 8-oz. mallet and very light instrument. The instrument should be in length in proportion to its size, and all according to what you may wish to do. With regard to mallets, I have a band of iron made, united with hard solder, and run the lead into it for a head. The making of the gold foil is confined to the manufacturer. We know there is a difference between adhesive and soft foil. I want that with a beautiful, bright, metallic surface. One-third of the value of gold is destroyed by pressing it in a screw-press, leaving the mark of the paper upon it. To use it I cut the foil, let it fall upon a napkin and roll it up with that. This roll is cut in pieces or attached at one end, and then built around. For annealing, the tube of the lamp should be made of platina or glass, so as to have a flame free from oxides. Be careful of the match, as the phosphorus may injure the gold.

I will describe how I filled a left superior lateral incisor, where one-fourth of the labial wall was cut away to get at the cavity. Get a perfectly smooth and straight labial wall; do not bevel it at all. This is done to have it strong. It may be started with a small chisel,—let it be strong and sharp. Then use a file to prepare the edges; get margin or edges all right; proceed until the cavity is fully prepared; with a fine drill, make a small retaining-point, or make little grooves. It is astonishing how much little pits will help to retain the gold. The rubber dam is indispensable;

you will come short of making a first-class operation if you do not use it. Put little hooks in the corners of the rubber, and attach to strings carried over the ears, to hold the dam up out of the way. He said that he divided the finishing of a filing into six stages:—first, filing; second, scraping; third, stoning; fourth polishing, with fine pumice; fifth, polishing with fine chalk; sixth, burnishing. He cautions all to be sure and wash off the filling well with soapsuds before burnishing.

### THIRD DAY.—*Evening session.*

After much discussion, Atlanta, Ga., was chosen, upon the third ballot, for the next place of meeting; and the association then went into the election of officers, with the following result:

*President.*—Dr. W. H. Morgan, Nashville, Tenn.

*First Vice President.*—Dr. S. W. Dennis, San Francisco, Cal.

*Second Vice-President.*—Dr. J. R. Walker, New Orleans, La.

*Corresponding Secretary.*—Prof. I. A. Salmon, Boston Mass.

*Recording Secretary.*—Dr. M. S. Dean, Chicago Ill.

*Treasurer.*—Dr. W. H. Goddard, Louisville, Ky.

*Executive Committee. For three years.*—Dr. G. H. Cushing, Chicago, Ill.; Prof. J. S. Knapp, New Orleans, La.; Prof. J. Taft, Cincinnati, O. *For two years.*—Dr. W. W. Allport, Chicago, Ill.; Prof. E. A. Bogue, New York, N. Y.; Dr. I. Forbes, St. Louis, Mo. *For one year.*—Dr. S. J. Cobb, Nashville, Tenn.; Dr. A. C. Ford, Atlanta, Ga.; Dr. J. P. H. Brown, Augusta, Ga.

*Committee on Publications.*—Drs. M. S. Dean, W. W. Allport and G. H. Cushing.

*Committee on Dental Physiology.*—Profs. Homer Judd, Thom. C. Stellwagen, and Dr L. Augspath.

*Committee on Dental Chemistry.*—Prof. T. L. Buckingham, Drs. C. C. Carroll and J. G. Willis.

*Committee on Pathology and Surgery.*—Prof. W. H. Atkinson, Drs. J. R. Walker and W. H. Morgan.

*Committee on Operative Dentistry.*—Prof. J. S. Knapp, Drs. H. J. B. McKellops and P. G. C. Hunt.

*Committee on Mechanical Dentistry.*—Drs. John Allen, W. H. Eames, S. B. Palmer, C. M. Wright, and B. B. Alford.

*Committee on Dental Education.*—Drs. G. A. Mills, S. J. Cobb, and, Prof. L. D. Shepard.

*Committee on Dental Literature.*—Drs. G. H. Cushing, R. N. Lawrence, and J. N. Crouse.

*Committee on Voluntary Essays.*—Drs. S. H. Beard, and C. D. Cook.

*Committee on Dental Histology.*—Dr. W. W. Allport, and Prof. J. H. McQuillen.

*Committee on Dental Therapeutics.*—Dr. H. S. Chase, Prof. E. A. Bogue, Drs. Thos. T. Moore and C. P. Baird.

*Committee on Dental Instruments and Appliances.*—Dr. J. B. Morrison, Prof. I. A. Salmon, Drs. S. W. Dennis and Corydon Palmer.

*Committee on Prize Essays.*—Drs. I. Forbes, J. P. H. Brown, W. C. Dyer, A. C. Ford, and J. W. Moffit.

*Committee on Dental Etiology.*—Profs. J. Taft, S. P. Cutler, Drs. R. W. Varney and W. O. Kulp.

#### FOURTH DAY.—*Morning Session*

Called to order at 10 A. M.

The session was opened with prayer. Minutes read and adopted.

An amendment to the constitution, offered by Prof. Buckingham, last year, was then read. It provided that

“No person shall be a member of this association who holds a dental patent, or is or shall be interested in one.”

After considerable debate it was lost.

Dr. Dennis called for Dr. Mills to continue his remarks.

Dr. Mills thinks the best excavators are the three-edged; he received from Dr. Brockway, of Brooklyn, N. Y., an instrument that is a sort of scoop; this is very generally useful; it does away with burs. His manner of filling teeth is

to wedge immediately. The main stepping-stone to success is the preparation of the cavity. He uses two excavators a scoop and a file, to finish edges. Like Dr. Palmer, he wants perpendicular walls. He has used many kinds of gold, but now prefers adhesive. He sometimes uses Morgan's plastic gold, in the bottom of the cavity, to facilitate and hasten operations. He uses foil, mostly Nos. 8, 10, 15, 40, 60, and 120, preferring Nos. 15, 40, and 120. He makes slots for retaining-points, and commences with heavy numbers, as they retain better and stronger. The heavy foils he thinks, produce a better class of work, but require more care in packing. He thinks that if fillings were hollow, but the walls well adjusted, they would be better. The packing of gold around the surfaces and margins of the cavity he thinks well of. Sometimes, in turning over the heavy foil, or folding, it makes a corner, and some object to it. He practices burnishing or beating the edges of the tooth and the filling, bending down solidly. When he says "beat," he does not mean a heavy or brutal hand,—it can be done with heavy pressure. In using the mallet, it should give the blow in the direction of the axis of the tooth. he has had cases where the mallet could not be used.

Prof. Knapp is no advocate of any extensive use of cements, but believes they may do well in some cases. He would not call attention to anything but a wash for cement it is the *Liquor Sodæ Chlorinatæ*. It is a deodorizer and alkaline, quickly removing all odor or smell from the hands. It gets rid of the oxide from cements. Equal parts of water with Labarraque's solution first, and finally washing repeatedly with alcohol, cleans the amalgam very perfectly.

Dr. Dickerman, in bleaching teeth, removes all of the carious portion of the tooth, and dresses with camphorated spirits for two or three weeks. If it is advisable, lines the cavity with oxychloride of zinc. A tooth is not dead so long as it has any attachment, and it may be restored to usefulness even when this is very slight. Abscesses that have been discharging from one to twenty-seven years have



healed. We then find cartilage formed. With regard to gold, he had seen teeth filled with from No. 2 to 640, or No. 20 doubled 32 times. Good fillings may be made with all numbers.

Dr. Mill. Gentlemen seem to have lost sight of principle when they talk of leaving a vacuum. There can be no vacuum in nature. He does not approve of sponge gold shingled over. With relation to cement, there may be circumstances where it may be of use, but it must be with caution. Many may jump at it, as they have not been able to fill with gold. He has in his own mouth the eleventh filling of a student, which is as good as any body could desire. All, or most all, can, by proper education soon learn. He thought it would be well to select a few of the best operators and pay them to go over the United States and teach dentists how to operate. Talk of teaching people,—let us teach ourselves until we are able to know what we are about. Why is the medical profession not willing to acknowledge us? It is because we are not educated.

Dr. Forbes. With regard to the number of instruments, as we advance, very few are used. The dental manufacturers, selling so many, reminds him of a teacher selling his instruments to his student, when he knows that the poorer the operator the more he needs good instruments. It is an axiom, that a man does not know a thing if he cannot communicate it to others. One operator says we can learn more by witnessing a single operation than hearing it spoken of for years. He was once taught here that napkins were not necessary and that *débris* can be blown out of a cavity! He thought a tooth could be better built up by cylinders than any other kind of pellets. In filling a tooth, Dr. Palmer made a slot and put a piece in it, holding it in its position until condensed. He then built down, claiming that, in twenty years after, if taken out, it would be pure and clean beneath! Now, if the heat beneath is 95°, what if the patient eats ice? It will reduce it to 35° or 40° and must contract.



We have just heard that Prof. Abbott's experiments are of no consequence!

If a cylinder were placed at the side of a cavity and condensed there, the filling may be thus one-half completed, and the cavity is gradually reduced as more and more are added. Cannot the small cavity left be filled as well as a large one? A cylinder filling will remain perfect as long as a keystone in an arch!

The paper by Prof. Knapp reads as if all should be made by cylinders with hand-pressure. If the mallet is used, it would be found to be a labor-saving machine.

He never touches his fingers to the flesh, but always lays a napkin in the mouth. Operators are telling us that by heavy foil they can put in more gold. He would like the experiment tried with cylinders.

With regard to operations in St. Louis, they have a book like a bill book with two diagrams of the mouth on each page, so that one can be torn off and sent to the patient. Then, by abbreviations by letters, they make the charges quite as well as by complicated, arbitrary signs.

Dr. Walker has met with success with biborate of soda for washing amalgams. He presented as an alloy for casting metal plates, in place of vulcanite—

Bismuth, 1 part;

Pure tin, 15 to 20 parts.

To make sharp castings, there is nothing that he knows of better.

Prof. Atkinson. The only way to learn is by close attention and presence at operations. He would prefer to have the filling hollow, if solidly adapted to the walls. With few instruments, under the inspiration of necessity, we can make excellent operations. We should not talk of contraction of gold from cold, and forget the tooth substance. There is no appreciable change of the two, or if any, it is not of importance.

How many are here who never saw their preceptors put a filling in a tooth in the mouth! Do not operate for any

one who will not permit a third party to be present. Let the students excavate teeth in the laboratory, and finally go to the office and do *as some of my students have done,—never make a failure.*

It is damnable for a man to wilfully destroy a pulp at any time. If any vitality is left, there is hope of saving the organ. Twenty years ago I came to that conclusion. November 4, 1857, I dedicated myself to save each, all, and every part it was possible to do.

Prof. Stellwagen exhibited two pairs of excising root forceps made according to patterns described by him in the Dental Cosmos for September, 1869. He wished that the members would suggest any improvements they might think of. He considered that, when roots are broken off below the alveolus, these are invaluable instruments, as they insure the extraction of the remaining portion with but little crushing or grinding of the surrounding tissues, making clean cuts through, instead of tearing out the sockets with the roots.

He also called the attention of the members to a pair of metallic boxes like impression-cups without handles, in which softened gutta-percha could be placed, and the whole pressed upon the teeth to hold them in position in case of fracture. By means of holes through the plates, he secured the washing of the mouth with jets of water, and through an opening in the front, fed his patient, and also kept the mesial line of the mouth in sight. These splints could be thus used for different cases, and admitted of being quickly adjusted. They were modifications of Dr. Allport's and Dr. Gunning's splints, differing from the latter in having the plates wired instead of soldered together, thus admitting of perfect adjustment of the two maxillæ without removing the splint. Changes, if desired, could be effected by drawing some of the wires tighter and loosening others. A few sets of these would prepare one for almost any case of fracture, and he thought, instead of plates, mere rims united by transverse bands would do better. The pair exhibited had been used by him

in a case of fracture of the inferior maxilla, and a perfect occlusion of the teeth was obtained in a short time, where it had seemed at first to be very nearly impossible to hold the fractured ends in position.

Dr. Walker urged the importance of endeavoring to instruct a patient to keep fillings upon the approximal surfaces of the teeth clean.

Dr Palmer. A cement in hardening will shrink a little ; it is said of amalgam that it will enlarge a little. The difference between a filling which hardens after putting in and a metal one that is hardened by pressure is very great. He don't advocate amalgams, only as experimental. Pure gold and pure tin are the very best materials used. If the gold don't come in contact with the cavity, a change takes place. Emery-paper is too harsh for use in polishing.

The report of the committee on Mechanical Dentistry was read by Dr. S. B. Palmer, chairman. It called for a substitute for vulcanite.

Dr. Allport took exceptions to *cheap* dentistry.

Report of Committee on Dental Education, by Dr. M. S. Dean, and accepted.

Dr. Cobb, of the same committee, read a paper recommending a dental journal to be published with the proceeds of a fund established for the purpose from the treasury of this society

Dr. Allen could not help comparing the condition of the dental profession with what it was when he studied. We have had many advances,—colleges, societies, journals, works, etc. While all this is advancement, we still want more, and it is the increased light that brings us to wish for greater perfection. The most of the artificial work made to-day will not compare with what it was twenty years ago. He feared we were neglecting this and attending only to operative dentistry. He gloried in the improvements in operative dentistry, but he regretted to see the association ready to pass over mechanical dentistry.

Prof. Taft. Dental education should interest all. Shall

those who come after us be equal to or superior to us? We should prepare them to meet the exigencies of an age when one revolution is rapidly following in the footsteps of another. There are other features. Are all the men now in the profession prepared for it? As we are laboring to raise them, let us consider if there is nothing more to be done than there is now. We have our periodicals and our associations: these reach but few. Of the eighty associations, perhaps one thousand would count all the members that are in them. Can nothing be proposed by which to reach the balance of the profession? This association had once attempted, by appointing a committee, to aid in organizing local societies; through it many were formed. This committee has died out. It should not be so; there is yet a large field for the work. Another idea is to appoint definitely a committee to go out among the profession, and gather them in classes to teach them and stimulate them to learn more, making normal classes, supported by this association or other means. Many have already offered to assist in such an undertaking. This would habituate dentists to meet together, and they would soon support the classes themselves. His great desire is that the most should be done to elevate the profession that our resources will admit of.

Dr. S. B. Palmer agrees with those who would improve our science and disseminate a general knowledge of it. He has given the matter much attention, and among the means offered there might be found some objectional feature. He proposed the printing of a circular or card, enjoining the importance of cleaning the teeth, which may be free from advertisements, and obtainable from this association at a moderate cost by members for distribution among their patients.

Dr. Crouse. Let us make better practitioners of ourselves, so as to show the people the greatest difference between the true and false dentist. He had suffered from his office and college instruction. If it had not been for dental societies he would, no doubt, have been plodding along yet. A defi-

ciency of colleges is that they have not enough clinical demonstrators, making the clinics or the infirmaries the great thing. Men who are run away with by their hobbies are not fit to teach! In dental societies he first discovered his deficiencies, and this had stimulated him to improve himself.

Prof. I. A. Salmon moved to read all reports first, and afterward to have the discussion in regular order. Carried.

Dr. M. S. Dean, Chairman of the Committee on Publication, reported that four hundred and twenty copies of the proceedings had been printed, at an expense of \$380, and the price to those not members was fixed at \$1.25 each. Two hundred and fifty copies of the new constitution had also been printed.

Dr. T. T. Moore offered, as an amendment to the constitution, that no one shall hereafter become a member who has a dental patent, or is interested in one. Laid over, according to law, for the next annual meeting.

Dr. Forbes offered the following:

*Resolved*, That the members are requested to bring with them to the next annual meeting such pluggers and excavators as they have in general use, so that when presented to the Committee on Instruments the committee may be enabled to make up a *complete set*, containing no more instruments than are necessary.

Dr. Shadoan spoke of the dissatisfaction at the place of meeting chosen. He moved to reconsider the question, which resulted in the selection of Niagara.

#### FOURTH DAY.—*Afternoon Session.*

Called to order.

Dr. Goddard offered, as an amendment to the constitution, that the meetings be held annually at such *time* and place as may be designated. Laid over for the next meeting

The minutes were then read.

Greenbrier, White Sulphur Springs, Virginia, was then chosen as the place of next meeting, as a compromise between Niagara, Atlanta, and San Francisco. The announce-

ment of the result was received with great satisfaction, and a question which had disturbed the harmony of feeling was thus ended.

Committee on Dental Ethics, Dr. Morgan, Chairman, reported with regard to the case of Dr. J. A. McClelland, finding him guilty on his own admission, but with mitigating circumstances, and moved that he be allowed five minutes to be heard. The subject was then, on motion of Dr. Cushing, postponed until Dr. McClelland should be present.

Dr. Kulp moved that a committee of three be appointed, who shall prepare a circular upon popular education, and furnish the profession copies for distribution, at a rate sufficient to cover expenses of publication. Adopted.

Drs. Kulp, Walker, and Peebles were appointed.

Dr. McClelland, of Louisville, then came in and made an explanation.

Prof. Atkinson moved that it be deemed satisfactory. Carried.

The customary ceremonies and speeches incident to installing the new officers were then gone through.

Dr. Cushing received permission to read a letter from Dr. J. W. Clowes, with regard to the rubber dam.

The writer stated that on the 13th of May, 1864, he was informed by Dr. S. C. Barnum of the discovery of this means of keeping teeth dry to facilitate the dressing or filling of the same. He then proceeded to describe how Dr. Barnum had caused the discovery to be presented to the profession, and how, when brought to the notice of practitioners in various places, it was first declared impossible to apply it successfully, then ridiculed, afterward objected to, and finally very generally adopted.

The Corresponding Secretary was then directed to forward a resolution offered by Dr. Dickerman, in which the American Dental Association formally acknowledged the discovery, and the admiration of the spirit which prompted Dr. Barnum to make such an important invention a free offering to his fellows.

Dr. Goddard wished the coffers of the Association could be well filled, so as to be able to make some appropriation for such cases as this. He would be happy if they had many thousands of dollars,—one of which he would like to see appropriated to the purchase of a suitable microscopical apparatus, so that Prof. McQuillen, or some such person, might give lectures and demonstrations.

The Corresponding Secretary was then directed to forward a resolution of this association acknowledging the gift.

Dr. McKellops. There was a motion here to-day about patents. Here was a young man Dr. Barnum, poor and struggling,—now what encouragement has he for his present to the profession which would have been a fortune to him, if he had chosen selfishly to patent it?

Dr. Allport was in favor of more than the mere motion. He would favor the taxing or voluntary contribution to raise a gold medal from the association.

Dr. Dickerman moved that the members of this association be assessed to the amount of \$1000.

Dr. Chisholm suggested that it be by *pro rata*.

Dr. Dennis would like to see it voluntary.

Dr. Crouse would prefer to see this done without compulsion.

Dr. Forbes moved that, in consideration of the great merits of his gift, this association contribute the sum of \$1000 to Dr. Barnum.

Dr. Cobb opposed a precedent of this kind.

A member thought this just the thing we did want as a precedent.

Dr. Forbes' \$1000 motion was then carried.

Drs. McKellops and Arthur were appointed a committee to get up a gold medal, at their own expense, for presentation by the association to Dr. Barnum.

Prof. Atkinson moved that the Publication Committee be authorized to make the best arrangements with the dental journals for the publication of the transactions of this body. Carried.

Dr. Shadoan moved that a delegate be appointed to the Southern Dental Association. Carried.

Dr. J. A. McClelland resigned.

"Operative Dentistry" was then taken up.

Prof. Atkinson. How would I bleach teeth? If iron discolors, cut all away but as small a portion as possible for strength; fill full of oxalic acid crystals; put a drop of water in the cavity, and mash the crystals in it. There are other agents,—salts of copper, etc.,—if we sufficiently understand chemistry, that would be available to bleach. We can use chlorine gas through a small glass pipette; must be carefully used, as it might cause oedema of glottis. Here the rubber dam is valuable. Chloride of lime, Labarraque's solution etc., are all good.

You must not hope too much in bleaching teeth. The great majority will bleach if left to the open air. Fill with wax for a short time, and, on taking it out, wash with salt water. Pure oxide of zinc with chloride of zinc is good to put in a creamy mortar, filling the tooth full, twirling a piece of cotton in it; then cut out all but a small, thin stratum, to see the color. Don't get the teeth too white.

I generate chlorine gas by black oxide of manganese and hydrochloric acid. This works very rapidly.

The agents supposed to color the teeth may be iron from hematin, as the mineral, or they may be of vegetable origin; if the latter, these colors are bleached by chlorine.

My process for saving nerves, or portions of them, is to cut away all diseased parts of the tooth possible without giving too great pain, and to sop with creosote every day—better twice a day. Often a little pus will come away. I have found the bulb come away, and leaving the pulps alive and red in the roots. In one case I have taken out the pulp of all but one buccal root. When recently exposed I treat at once; but, if not, I treat several days, and then I claim that I am no worse off than at first if I should find the pulps dead. Never put arsenic in a human being's mouth. Then put oxychloride of zinc, of creamlike consistency—introduce



on cotton, trimming off and filling with gold; or fill temporarily or preparatively with oxychloride of zinc.

I make this distinction between creosote and carbolic acid. The latter is crystallizable acid from coal; creosote is a combination of two acids—cresylic acid and carbolic acid. Pure Scotch or German creosote from beech wood I prefer, but don't know why; the perception has not got into me yet.

Every diseased action is below the standard of life, none above. I use creosote to make a carbolate and cressalate of albumen, to make a protection like a scab. This I call calciferous matter or it may be secondary dentine substance. I have only a little or crescent-shaped particle form upon one side of the exposed portion of the pulp, and sometimes have seen all filled up. I always leave a little creosote in every cavity, and do not wipe out too dry. I once put in the capping without pain, on the pulp, and there was none for some time after, but the patient returned, suffering, and I opened and found an empty pulp chamber. This is better than destroying nerves any other way. Creosote cannot destroy beyond a certain point, unless the pulp is unhealthy, for the saturated condition of the pulp will not take up more than to make this pellicle, which protects the balance.

Alveolar abscess will not occur, unless the liver or the pancreas is out of order. Lower the circulation, give an emetic, and follow up with a cathartic. To the point or seat of pain in the gum apply hot or cold water; no lukewarm. Hot is above  $112^{\circ}$ ,—say  $150^{\circ}$  or  $160^{\circ}$ . Apply hot or cold, which ever comforts the patient. You may begin with hot flannels (wrung out in hot water), using hotter and hotter, until you come to the extreme heat. White corpuscles are young corpuscles; if they die, they become pus corpuscles.

Aconite stops neural circulation; so does heat. They drive back the circulation by contracting the capillaries. If pus corpuscles have formed, cut and let out these devils—*exorcise* them.

If abscess has opened, go through the root and enlarge it

until blood comes through. Wash with water and tincture of calendula. Thus I get rid of all foreign substances, go through the alveolus, and amputate the end of the root if it is necrosed ; fill with gold by making a shoulder inside of the pulp canal, and to this point in each root press the gold, filling it completely. Then open the fistula large enough to see the apex of the root, and cut or polish off, as you please. Inject sulphuric acid and water, taking care not to let it run over the mouth ; then fill the opening with tannin and glycerin. Chloride of zinc may be used, 480 grs. to the oz. of distilled water. All fibrils found in teeth are post-mortem results. Tomes does not call them nerves.

A resolution authorizing committees to put on sale, at any depot, the printed copies of proceedings, was then carried, the price of the large books being fixed at \$1.50, and the small at \$1.00.

Adjourned.

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#### ARTICLE IV.

*Virginia State Dental Society.*

*Editor American Journal of Dental Science.*—Dear Sir : I am requested to announce through the pages of your journal, that a meeting of the Dentists of the State of Virginia, is proposed to be held in Richmond, on the third day of November next, for the purpose of organizing a "State Dental Society" and for the transaction of such other business as may come before the meeting.

It is proposed to imitate the example lately set by the Medical Faculty of the State, in memorializing the Legislature to secure the passage of an act for the better protection of the regular practitioners of dentistry in this State, and thus aid in elevating the standard of the profession.

Dentists of this State and others are invited to attend. Any further information may be obtained by addressing Dr. James F. Thompson, of Fredericksburg, Va., or the undersigned James B. Hodgkin, Alexandria, Va.

## ARTICLE V.

OFFICE CORRESPONDING SECRETARY,  
SOUTH CAROLINA STATE DENTAL ASSOCIATION, }

COLUMBIA, S. C. Sept. 27th, 1870.

*To the Editor of the American Journal of Dental Science:*

DEAR SIR:—You will greatly oblige the members of the South Carolina State Dental Association, by inserting the following in your very valuable and widely circulated journal:

“SOUTH CAROLINA STATE DENTAL ASSOCIATION.”—The regular semi annual meeting of this association will be held in Charleston, S. C., commencing Tuesday Nov. 1st, at 8 o'clock, P. M. All dentists in the State are cordially invited to attend, and brother dentists from other States will receive a hearty welcome.

The usual Railroad reductions of going and returning for one fare will be extended to members, &c.

THOMAS T. MOORE, *Cor. Sec.*

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## SELECTED ARTICLES.

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## ARTICLE VI.

*Histology of the Dental Tissues.*

Professor Judd on Professor Noel's Reply.

In the April number of the JOURNAL, we passed in review the principal articles found in a previous number of the “American Journal of Dental Science,” and among the rest one by Prof. Noel, upon the histology of the dental tissues. To some of our views, as then expressed, the author of the article referred to objects, and replies at considerable length in the June number of the “American Journal.” As the subject itself is one of interest to the whole profession, and as it is important that all new doctrines should be carefully examined, we shall offer no apology to the readers of the JOURNAL, for referring again to this topic.

We do this, however, with no captious intent of defending

positions, which we may have previously taken, simply because we have committed ourselves thereto, but for the purpose of arriving at the truth. The assertions by the author that "Fresh dentine has no tubuli, but has uncalcified fibrillæ solid or nearly solid," also, "that the tubuli found in the dry tooth, or dead and dry teeth, are formed by the desiccation and evaporation of these dentinal fibrillæ, and have no existence in the living tooth," were very briefly commented on, and have brought forth a rather spirited reply. The author complains that we have based our argument upon the unauthorized assumption that there are hollow rods in fresh dentine. The only difference in the author's views and our own upon this point is simply one relating to the proper nomenclature to be employed, and that, i. e., the nomenclature made use of, was what we had reference to when we referred to the *conversion* of hollow rods into fibrillæ, as doubtless our readers generally understood. We would remark, in the first place, that a hollow body is not necessarily one that has a vacuum within it, as the heart is a hollow organ, which is filled with blood; and the venous and arterial *tubes* are, nevertheless, hollow *tubes*, even if the blood in them has not been desiccated or evaporated. Now, if the fibrillæ of the dentinal organ are calcified upon their surface, whilst their central axis are fluid, or at most, soft solid, are they not tubes just as much before their contents are desiccated or evaporated, as they are after those changes have taken place, which have reference only to the contents themselves? Therefore we do not think that the "tubuli found in the dry tooth, are *formed* by the desiccation and evaporation of these dentinal fibrillæ, and have no existence in the living tooth." We prefer, therefore, to speak of dentine as made up of a connective tissue base, which, with the lime salts deposited in it, assumes the form of tubes radiating from the periphery of the pulp to the periphery of the dentine. We enumerate, also, as a part of the dentine the contents of the tubuli just as we would in describing the cementum or other bones, include its connective tissue base and salts, the con-

tents of the lacunæ, and when Haversian canal are present, their contents, that is to say, the veins, arteries, absorbents, &c., are as much a part of a bone as is the phosphate of lime or its connective tissue; consequently we should differ again from our author in our description of dentine, as he states that "all dentine is calcified fibrillæ," whilst we consider the nuclear matter of the dentinal tube, as well as the uncalcified formed material, as parts of the dentine. But enamel and dentine are not vitalized tissues, so far as their *calcified* portions are concerned. "Enamel is dead, perfectly dead," &c. The author does not deny but that the enamel organ and the dentinal organ were vitalized structures up to the very moment that calcification took place, when they became enamel and dentine, consequently dead tissues. We would ask, "What are the evidences of their death?" There is no proof that any change in this direction in the connective tissue base of these structures has taken place at all. The salts may be removed, and the base, at least in dentine, remains in them apparently as perfect as it was before the deposition of salts took place. It was a soft tissue before and it is a soft tissue after the salts have been removed from it; and we have no reason to believe that no vital changes have taken place in this organic base whilst it has been surrounded and infiltrated with inorganic matter. But as the author has seen fit to give us his definition of a vitalized tissue as one "changing under vital forces—exhibiting the three forces of organic life, (1.) assimilation, (2.) propagation, (3.) developement"—we would simply state that we consider a tissue vital which has the power of assimilation, without any reference to its propagating or developmental powers. Now, so far as any light has been thrown upon this subject, in reference to enamel and dentine, it goes to show that nutrition does take place in the organic base of these tissues. It has not only been observed by dental practitioners that the teeth grow harder as age advances, as is universally acknowledged, but that they also, under certain circumstances, grow softer, or at least more friable. It is well

known to dental practitioners that where the pulp of a tooth has been destroyed, and all "vascular and nervous supply" cut off, that the dental tissues become more friable and more liable to decay. At least we think this will accord with the opinions of a great majority of the most reliable and observing men in the profession. We do not claim for this argument the force of a demonstration upon this subject, but it is at least entitled to more consideration than a bare supposition that has no single fact to which one can point that can in any degree relieve its inherent weakness. It has not yet been demonstrated that nutritive changes do not take place in the organic bases of dentine and enamel; but, on the other hand, we think that all the light we have upon this subject would lead us to an opposite conclusion.

In reply to an assertion of ours, that constant change is stamped upon every atom of matter throughout the universe, the author says; "Every atom of matter in the universe may be under a law of 'incessant change,' but if the changes are to us inappreciable, I contend that it is not proven. \*

\* \* \* I have a friend traveling in Europe; he writes to me that he saw at a cathedral a molar tooth said to have belonged to one of the apostles or bishops of the early Church, evidently some hundred years old. Now, perhaps the 'organic base' of the enamel of that tooth has been undergoing constant change for the last eighteen hundred years, or at any rate, a great number of years; but my friend failed to appreciate it, for he said it was a fine tooth, in a state of excellent preservation."

We will suppose that side by side with the "molar tooth" lay the foot of a live frog, *apparently* motionless, a microscope would have revealed therein a field of activity truly surprising—blood corpuscles rushing through veins and arteries—leucocytes creeping along the inner walls of the various vessels—pigment cells scattered along here and there, altogether forming a scene of wondrous magnificence and beauty—but his "friend" would have failed to have appreciated it. A glance by the naked eye could not have

revealed these wonders. So these changes of nutrition and decomposition, although no less certain and wonderful than the changes in a frogs foot, are not usually appreciated upon a mere casual observation.

But it is objected that we have cited *sensibility* as one of the signs of vitality. After stating that enamel is "perfectly insensible," he qualifies this by stating that "if enamel ever gives evidence of sensibility, it must be in extremely rare cases, and only when the dentinal fibrillæ have been prolonged into the enamel organ, and have escaped calcification, thus giving an unbroken line from enamel to pulp." We have only to remark in relation to this that the condition described by our author above is not, according to our observation, very rare, and that it is not certain but that that very state of things always obtains. We have no doubt but that the sensitiveness of enamel is due to the extension of the dentinal tubuli with their soft contents into the enamel.

Tomes states that in a well developed tooth a certain number of the dentinal tubes will be seen to pass across the line which marks the junction of the enamel and the dentine, &c., \* \* but in teeth of less perfect organization, the dentinal tubes, often passing into the enamel, become suddenly dilated into comparatively large elongated cavities. As the author says, "The pain in decay is dependent upon the dentinal fibrillæ." And as we have just shown that even in well developed teeth, the *fibrillæ*, or tubes, are continued into the enamel, would we not reasonably conclude that we should sometimes have *sensitive* dentine, even if our every day's experience did not demonstrate that it is so.

But again controverting a statement that we had put forth, to the effect that sensitiveness is one of the most certain signs of vitality, wherever it exists he says: "sensitiveness is not one of the most certain signs of vitality **wherever** it (vitality) exists, nor **wherever** it (sensitiveness) exists (sentence capable of each construction, and wrong in each)."

Now, in relation to the first construction, and the only one which is here argued by our author we would say that construed in that way, it would be evident to the merest tyro that no argument could be made in its favor, so that all the labor expended in that direction was thrown away; but with the second construction, which our author acknowledges to be also legitimate, and which we intended should be placed upon it, the case is entirely reversed, no argument of any force can be made against it. In order to controvert this it must be proved that sensitiveness can exist where there is no vitality, a task which, we presume, will not be hastily undertaken.

In relation to the developement of the "dentine organ" the author says: "Simultaneously"—that is, at the same time that masses of germinal matter make their appearance upon the inner surface of the tunica reflexa—"there is found upon the external surface of the pulp, i. e., external to and resting upon the tunica propria, masses of germinal matter, which grow towards the germinal matter projecting from the surface of the tunica reflexa until they meet at the line of conjunction." It is at once evident that, according to this description, the tunica propria separates the dentine organ from the pulp. In the author's reply he says that the fibrillæ of the dentine organ blends in organic continuity with the pulp tissue. If so, what has become of the tunica propria? Now, it has been held by nearly all of the best histologists of the last twenty-five years, at least, that the dentine was formed beneath the tunica propria. Beale, however, dissents from this view, but he does not state that the dentine organ is formed by *germinal matter, external to and resting upon the tunica propria*, as that would not accord with his views concerning the relationship which exists between the dentine organ and the pulp, for speaking of the cellular elements of the dentine organ, he says these elongated cells are not separated from the nerves, vessels and connective tissue, and, in some instances, seem to be continuous with them. We, therefore, very naturally remarked



in our first article, "that it would be new to our readers that the dentinal organ is formed external to the tunica propria," &c.—*Missouri Dental Journal*.

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## BIBLIOGRAPHICAL NOTICES.

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*The Physical Life of Woman:—Advice to the Maiden, Wife and Mother.* Sixth Edition. By Geo. H. Napheys, A. M., M. D. Author of "Compendium of Modern Therapeutics, etc., etc. Publisher, George Maclean, Philadelphia, New York, and Boston. This truly useful work, which should be in the possession of every mother, treats of the three peculiar phases of woman's life—namely, maidenhood, matrimony, and maternity. The language used is plain yet decorous, and the author deserves the gratitude of the community for thus inculcating a sound understanding of the relation of the sexes. It abounds in useful advice, and is countenanced by many distinguished physicians and divines. The fact that the fifth edition and tenth thousand was issued within three months from its first appearance, is evidence of the kind reception it has met with, and the good it will accomplish. The want of such a work as this has long been felt, and its publication demanded a degree of moral courage, which few have before this effort of Dr. Naphey's, been disposed to exhibit, through fear of the criticism which such an attempt would bring forth. But, as the author of this work truly observes, "ignorance is no more the mother of purity than she is of religion." The style in which it is gotten up is neat and attractive, and also, creditable to the publisher.

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*The Medical Times.*—This is the title of a new semi-monthly journal of medicine and surgery, which is published by J. B. Lippincott & Co., Philadelphia and New York. Judging from the table of contents of the first two numbers which have been issued, we feel assured that this journal will rank among the best of the medical publications of our country. The yearly subscription price is four dollars, in advance.

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"*Webster's Dictionary*," says a Paris letter to the *Boston Post*, "is now considered throughout the continent of Europe, not only the authority *par excellence* in English lexicography, but as the characteristic American book. It is better known and more widely circulated than any other. I have met with it at the Imperial Library in Paris, the Library of the British Museum, the Athenæum and other London Clubs, and numerous other places. I have heard of it from Turkey, India, China, and even Japan. It

is everywhere deservedly applauded for the elegance of its type, the distinctness of its impression, the beauty of the engravings, and the vast amount of information condensed within its covers. It has already taken a prominent part in moulding the English language and aiding the advance of its evergrowing empire. This result must, of course, follow from the use of a work that is found wherever our tongue is extending, as it rapidly is, through commerce and trade, among the Eastern nations. As now appears, there is no limit to its progress, and the vigilant thrift and untiring industry of the Anglo-Saxon race will insure the spread of its speech wherever their sails brighten the sluggish waters of a foreign harbor. If the language of the Bible and Shakspeare, of Burke and Macaulay, do not deteriorate in our mouth and in the utterance of those who deal with us, it will be largely owing to the onerous labors of the great Lexicographer, and the diligence of those who have so widely disseminated the evidence thereof."

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## EDITORIAL DEPARTMENT.

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*Mental Strain as a Disease.*—Dr. B. W. Richardson, of London, has recently referred to the importance of studying the influence of impressions made through the mind upon the organs of the body.

He contends that when the mental powers are so greatly overtasked, as they are at present times, this study claims the immediate attention of the general as well as the psychological physician. Dr. Richardson in describing the different classes of men who are engaged in labors which call forth the energies of the mind, divides them into "copyists, authors, artists, speculators, professionals and students. He defines the nature of the work of these respectively, and the diseases to which they are subject as the effect of their labors.

Turning to the diseases in detail, Dr. Richardson places not only paralysis, insanity, epilepsy, intermittent action of the heart, and arterial enervation with symptoms simulating aneurism, but also diabetes and cancer, as diseases directly connected with mental strain in persons who have an hereditary tendency to them.

As relates to insanity itself, the author holds an opinion different from that commonly entertained, in his asserting that work, and even hard work of a mental character, does not of itself bring on the disease, but that by such work the organs of the body which are purely physical are most severely injured. Insanity is, he thinks, a disease growing out of ignorance and mental inactivity; so that, in fact, the sluggish parts of the popula-

tion are the most determinate producers of insanity, and the educated and most intelligent parts of our population are the producers and propagators of the more serious and fatal of organic diseases.

But in reasoning on the share which undue strain on the brain—the material organ of the mind—has in causing insanity, there is one important distinction to be constantly remembered, viz., that between the faculties purely intellectual on the one side, and the feeling, emotions and passions, which make up the largest portion of the functions of the brain, on the other. More commonly it will be found that insanity is the result of excessive indulgence and contentions in these latter, rather than in a simply severe taxing of the intellect alone.

This belief will be fully borne out by the history of genius in all its varied manifestations. And again, the intellect of a student is often supposed to have become weakened, if not lost, by too close and continuous labor, when, in fact, the result was chiefly due to irregular hours, strong drinks, and not seldom tobacco or opium."

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*Among the Dentists.*—The following amusing account of a Reporter's visit to the American Dental Association meeting, held in Nashville, is taken from the "*Banner*" of that city:

"A newspaper man is supposed to feel an interest in everything, big babies, big turnips, horse races, base ball clubs, robberies, elections for constable, and all sorts of things which engage the attention and excite the interest of one or many. So we went up to mingle with the tooth pullers. A very intelligent body of men they looked to be. The majority fully up to or above the medium size, and most of them possessing serenely joyful countenances acquired from the constant contemplation of excruciating human suffering. There were a few, however, fragile and effeminate looking delegates, who, from appearances, would not be able to hold a two pound weight at arm's length. It won't do, however, to calculate on a dentist's strength from his appearance. We once knew a girlish-looking member of the profession whose complexion vied with the best pearl enamel or lilly white, whose eyes were as blue as the sky and who had nothing manly in his appearance, save his moustache. This sign of virility was coal black, and would have done honor to any man six foot by three. It was not unlike two gigantic caterpillars bristling for combat under his nose. The person who counted on his being weak labored under a painful delusion. Weak, did I say? Why, the fellow actually practiced with a pair of fifty-pound dumb-bells, and rung the changes in them with an ease and grace which would have done honor to a circus athlete. His muscles were like bands of steel. We have seen that effeminate-looking man throttle a giant six feet four and

broad in proportion, who was perfectly wild with the torture of the instrument and was struggling like a lion in the operating chair, wrench open his jaw and draw out the offending tooth as though he were handling an unruly child.

In one of the ante-rooms of the hall of meeting, there were a couple of those improved racks for torture called dentists chairs. Ah, how softly padded were those deceitful machines, and how bright the velvet with which they were covered. A red haired sanguine looking man was illustrating, with the help of an assistant, the vast advantages which they presented as compared with the old fashioned chair. That was a wonderful seat which the chief executioner was illustrating and expatiating upon with great volubility. It bristled with polished cranks and screws and slides that made our blood run cold as we saw them swiftly manipulated. A single turn of a crank would throw the unfortunate patient into a horizontal position and enable the operator to throttle him while thus helpless; another thrust and the chair swung to one side and the victim's head could be pinned under the operator's arm as in a vice; touching a lever and turning a crank shot the occupant several feet in the air, where he could be firmly held and his upper jaw devastated while he was helpless; touching the lever again and turning the crank lowered the sufferer to the floor in such a position that he could be secured motionless by the operator's knee. The eyes of those around us gleamed with strange satisfaction, and their countenances were lighted up with exultation as they watched these rapid movements. We alone stood spell-bound with horror. What if those savage men longing for a victim should seize upon us and pin us to that horrible rack? We fled from the spot.

As we passed up the room we saw another door ajar. There was no one within, but upon a long table were displayed all those keen and glittering instruments of torture found no where except in a dentist's operating room. A horrid fascination caused us to enter. Did you ever shudder at the dreadful display of tools known to no profession but that of the man who cures the tooth ache. We have, and those dreadful forms will live in memory while life shall last. Well, imagine all the blood chilling instruments of a score of dental establishments collected together and spread out in one awful array. There were big forceps and little forceps, cork screws and chisels, and big cant hooks, which looked as though they were made to lift the teeth of a mastidon. There were drills and punches, and bodkins, and files, and saws, and lancets, and screws, and sharp tubes, and dreadful looking machines for applying laughing gas or ether. To one side stood a bushel basket full of teeth, old roots, pieces of jaws on jaw, broken and forked fangs, decayed in all sorts of ways. They were grim trophies, and we retreated

from this place even more speedily than from the first. If we don't have the night mare for a six months we shall consider ourselves lucky.

But now the hour of meeting had arrived, and the President of the Association, a veteran operator, with a countenance hard and stern, called to order.

The particular subject up for that day was operative dentistry. And presently there arose a *sallow*, feeble looking man, whose voice was also feeble and obstructed, to lecture. He first showed how the dentist could keep his accounts without having recourse to a book, and in a sort of dental short hand. Diagrams were used in the illustration and explanation, and we remember that the first was a female head, after some classical model perhaps, with the face cut up into four sections by lines passing, the one perpendicularly through the nose, and the other horizontally through the mouth. The next diagram showed the teeth as they would be divided by these lines, and we learned that we had thirty two teeth, or at least should have that number, had not five or six of them retired from business. The four sections were named right superior, left superior, left inferior, and right inferior. The next cut showed four sets of figures, from one to eight, standing off like classes in a district school. These figures represented the teeth, and by an ingenious arrangement of hieroglyphics, the lecturer proposed to note at once what had been done to any particular tooth in the human head.

Now, said he, I regulate the amount of my charges just according to the amount of force, vitality or nervous energy expended in an operation. I will not work in any other way and my patients all understand it. I make my charges on the spot when I can calculate just how much vitality I have consumed in the work. The lecturer looked as though, on this scale the filling of a tooth would cost about \$75 or \$100.

The speaker now described the process of filling a tooth. It was very interesting. "Take," said he, "for instance, the second molar anterior, right proximo, cavity inclining towards the labial wall. First, cut away the face, smooth down, saw out and leave strong angles. Now commence with No. 0, put down the point firmly and strike with the lead mallet; build up all around, carefully filling the lower and upper inferior and superior arches and the right anterior cavity, using tools Nos. 1 and 2. Lay on the gold with the seratims and advance to the proper angles and finish off carefully the ridges and valleys, promontories and capes of the original.

This was clear and lucid, we began to feel like a dentist. The man is a wonderful one thought we. At the end of the lecture we found ourselves standing beside a tremendous six footer from

St. Louis. "Doctor," said we, "who is this doctor P—" (the lecturer.)

"He is," replied my gigantic friend, "a gentleman from Ohio; one of those erratic geniuses who are so difficult to follow. Now, with the exception of a few minor points, perhaps, in what does his mode of operation differ from yours?"

This was a stunner. Yes, to be sure—what was the difference. We were plunged into a profound reflection. We revolved the whole subject from beginning to end. We have thought of it constantly ever since, and we pledge you our word, reader, we can not up to this moment decide in what his mode of operation differs from ours. This is the penalty of being mistaken for a dentist. "In what —," why, it may take years to solve that question."

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## OBITUARY.

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*James Baxter Bean, D.D.S., M.D.*—The sad duty once more devolves upon us of announcing the death of an alumnus of the Baltimore College of Dental Surgery,—that of James B. Bean of this city.

By letters received at the State Department at Washington, we learn that Dr. Bean was one of the eleven unfortunate men who perished by an avalanch in attempting the ascent of Mont Blanc, in September last. He left Baltimore on a pleasure trip to Europe, in company with Dr. A. H. Balderston, his former associate in practice, about the middle of July last, and on the 13th of August, after parting with his companion at Paris, Dr. Bean went to Switzerland. A correspondent of a Boston paper writing of the disaster, thus describes the opening of some of the effects left by the unfortunate party at Chamouni previous to the fatal ascent: "Then we receive a bundle tied in a handkerchief of white linen. It is Dr. Beans. It contains his passport, made out at Washington July 12th, 1870, and forwarded to him at 58 Saratoga St., Baltimore Md. We find he is sent out by the Smithsonian Institution, and is recommended to the respectful attention and helpfulness of scientific people in Europe. There are some fine geological specimens found by him in the last few days.—There is a needle book and buttons, silk, cotton, and other endearing evidences of a woman's care. In an unsealed envelope I find, neatly sewed upon a card, a cross of white crystal. Above and below the cross are written in pencil these words: 'Top of the Bevent, (8,284 feet,) September 3, 1870. Beckie! bless your darling little heart! This shall be for you, for I thought of you as soon as I saw it.'"

Dr. Bean was a native of Florida, and practiced several years in the town of Micanopy, in that State, previous to entering the Baltimore College of Dental Surgery, where he graduated in 1860. After graduating, Dr. Bean practiced in Augusta and Macon, Georgia, and during the war had charge of a ward in one of the Confederate hospitals, devoted to the treatment of fractures of the jaws, holding the rank of Assistant Surgeon. A short time after the close of the war, he settled in Baltimore and succeeded in establishing a remunerative practice, in the prosecution of which he displayed untiring energy, and was highly esteemed by all who knew him.

Dr. Bean was the inventor of an Interdental Splint, composed of vulcanized rubber, which many eminent Surgeons have pronounced a valuable appliance, possessing great advantages in its complete reliability after being adjusted, being easily managed by an ordinary nurse, not easily displaced by the motions of the patient, and uniformly giving great ease and comfort.

He also invented a very complete apparatus for the manufacture and administration of Nitrous Oxide Gas, and his name became widely known in the dental profession for his valuable improvements in the manner of working Aluminum.

Dr. Bean leaves a wife and child in Jonesboro, Tenn., and for the benefit of the latter just previous to his departure from Baltimore, he effected an insurance of \$10,000 on his life.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV. THIRD SERIES—NOVEMBER, 1870. No. 7.

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ARTICLE I.

*The Effect of Animalcules on the Teeth.*

By GEORGE B. HARRIMORE, D.D.S., Boston, Mass.

Great enthusiasm in all that relates to dental science, now animates a very large number of dental practitioners. This is peculiarly gratifying as it will lead to further discoveries and bring to the dental art greater perfectness.

Already this enthusiasm has led to a variety of investigations, not only of matters directly in the line of dental science but of other subjects of remoter bearing, that every thing might be gathered which could enlarge the knowledge and skill of the dentist. With the continuance of this enthusiasm, the profession will be increasing both in power and usefulness.

The fact of the increasing number of dentists who are the most busy in the laboratory and in operating at the chair, and who yet find time for investigating the causes of injury to the teeth and of the best methods for the removal of these causes, argues well for future generations. Such investigations must result in discoveries, not only of violated physiological laws which have brought sad disasters to the mouth, but of other destructive agencies which have long been at work on the teeth without observation and hindrance.



We begin to experience the effects of these investigations. But for them the destructive power of living matter first known as *animalcules* and subsequently as infusoria, and more recently as *bioplasms*, would not be known. Having made this order of animal life a specialty in study, I have urged to submit to the public some of the results of my investigations.

The term animalcules, though not strictly connected with the nomenclature of modern zoology, is used as most familiar to the ordinary mind, to denote some of the more minute forms of animal being for a knowledge of which we are indebted to the microscope.

Almost the first revelation made by this instrument was this extensive source of life. This was in the latter part of the last century when the microscope was in comparative rudeness as *Leuwenhoeck* was experimenting with the instrument. *Gluchen* reduced this branch of life to a little system. He was succeeded by O. F. Müller who effected the first regular and scientific classification of animalcules. After this period the subject was at rest for some time and was at length revived by the celebrated Ehrenburg who published an elaborate work, and to whom more than to any other individual in former times we are indebted for definite knowledge on the subject. Since his publication the science has been prosecuted with vigor and success in France by Dujardin, in Germany by Tiebolet, Kolliker and others, in England by Owen and in the United States by Bailey.

The investigations of alternate generations by Stein and Agassez, have had the effect to stimulate other minds to research by the new light which these distinguished scholars and naturalists have thrown upon the subject.

As before intimated, by the earlier writers, animalcules covered all the life which was developed by the microscope. Plants and animals, mollusks, crustaceans, insects, worms and perfect forms were grouped together under the term "animalcules," and modern scientific men have bestowed great labor in their classification, and the result has been the formation

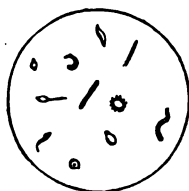
tion of a class to which Müller gave the name Infusoria. An English writer, however, Lionel S. Beal, M. B. F. R. S., in a small, though elaborate and learned work lately published, gives to this class the name Bioplasm from the Greek words signifying life, and plasma. By way of explanation he says: "Now that the word Biology has come into common use it seems desirable to employ the same root in speaking of the matter which it is the main purpose of biology to investigate." It is of this order of life that I propose to treat in the present article, as it is found in almost every human mouth exerting a mighty power in the waste and consequent destruction of the teeth.

The salivary calculus which is precipitated in a greater or less quantity upon the natural or artificial teeth whenever the fluids of the mouth are at the best, is composed of earthy phosphates about eighty per cent. salivary mucus and flattened epithelium nearly twenty per cent. When this is subjected to the microscope and examined with one sixteenth of an inch immersion objective, and a high power eye piece or ocular which magnifies about twenty-five hundred diameters, there can be seen living, moving bodies of divers forms and size, some long acicular, dish shaped, stellate and in a very few instances some bearing strong resemblance to the pimento berry, seemingly though not really more elongated.

My belief is that a cubic inch of tartar thus formed, is a deposit of no less than two hundred and fifty millions of this order of life existing about the teeth, gums and alveolar processes! These beings are so diminutive as to measure individually less than the fifty-thousandth of an inch in diameter. Wherever the most minute quantity of salivary calculus can be detected on the teeth by the naked eye, thousands of these busy beings may be witnessed by the aid of the proper magnifying power. As I have watched the activity of this industrious throng, and thought of spongy gums, absorbed alveolar process, and of the teeth quivering in the mouth, and furthermore as I have seen these bioplasms work their way to a single epithelium cell taken from the

nuous membrane of the mouth and to all appearance, su  
away a small portion of its contents, I have not hesitated lo  
for the cause of this great disaster. These animalcules  
bioplasms are continually at work, and at length rob t  
mouth which gives to the face its greatest beauty and expr  
sion. For the reason of their destructiveness in this regard  
is no marvel that, that noted man in dental practice and  
less famed in dental science, Prof. W. H. Atkinson, of N.  
City, reiterates to all in the profession "to clean the te  
is the first duty of the dentist to his patient; for cleanlin  
is irreseparable from health and beauty." The teeth,  
necessary to the digestion of food, so instrumental in  
manufacture of the atinosphere of the mouth, and so inc  
pensible to a pleasing and attractive expression of coun  
manance, should always be cleanly to be abiding and o  
healthy tone. The dentist is to remember that not only  
infusoria or bioplasms destructive to the gums, teeth a  
alveolar processes of the patient, but that they engende  
foetid breath of extreme unpleasantness to all coming  
contact with it, and of great power in the production  
bodily disease. He should, therefore, impress upon  
under his care the necessity of having their mouths clean  
of these destructive agents.

The subjoined cut represents the smaller infusoria  
bioplasms, not usually detected by a low power objective



By this cut it will be seen that these lit  
creatures are magnified to about twen  
five hundred diameters.

If the position taken in this article  
correct, and I think it cannot be successfu  
controverted, some may inquire for a re  
edy. My treatment and the one I recommend is, in the fi  
place, to cleanse the teeth of all extraneous substances, a  
then paint around the teeth and gums with a solution co  
posed of one part by weight of crystalized carbolic acid a  
five of glycerine, to which two parts of water are add  
when it is ready for use.

It is a most singular phenomenon that the little creatures, infusoria or bioplasms, in their incredible numbers, their universal distribution, and their unsatiable voracity, devouring particles of matter which have decayed both animal and vegetable, for the making of the atmosphere we inhale salubrious, should in the human mouth become the ministers of disease and destruction. Nor can the phenomenon be solved on any other hypothesis than that the august Architect of the human frame, in his care for what appertains to the beauty and healthiness of man, designed that the mouth should have constant attention, that its fluids needful for health should be so treated as not to generate an order of life certain to work destruction to the teeth. Hence the lesson is most significant to the dentist and his patients. They are to heed this divine admonition and have the mouth free from these persistent little destroyers.

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## ARTICLE II.

### *Mercurial Salivation.*

By DR. JOSEPH R. WOODLEY.

Mercurial salivation and its sequelæ are peculiar among the many diseases against which the dentist has to contend. This affection has several synonyms, among the most common and characteristic of which is ptyalism. Generally it is, therapeutically or pathologically speaking, a condition resulting from the constitutional effect of certain remedies administered with a view of lessening the plasticity of the blood in diseases of a sthenic form, characterized by great plasticity of that fluid.

There are several articles in the *Materia Medica*, whose action in the human system is manifested on the gums and mucous membrane of the mouth and throat. These agents belong both to the vegetable and the mineral kingdoms. Many of them, especially those of the former, excite simply increased action of the salivary glands, while others of an inorganic nature, show their effect on the glandular organs

of the mouth and pharynx only through the system at large such as the preparations of mercury, iodine, gold, etc.

But first of all let us define the condition termed salivation: It is an excessive flow of saliva from the glands of the mouth and adjoining parts, whose office it is to secrete this fluid for useful purposes in the first process of digestion. In ordinarily mild cases of salivation, this flow of saliva is accompanied by an irritation and slight pain in the glands, generally ceasing after a few hours, at the farthest in a few days, after the discontinuance of the exciting cause.

But it is of *mercurial salivation*, and its effects on the mouth and teeth, that we shall treat at present. We find that after the administration of any of the preparations of mercury to an extent varying in different individuals, an increase of salivary fluid occurs, with more or less tenderness about the gums, and fetid breath; a grayish blue line is often seen along the alveolar ridge embracing the teeth, with a metallic taste in the mouth which continues for days. This taste is "copperish." If the administration of the mercury is kept up, or has been already "pushed" to a considerable extent, the teeth lose their firmness—the gums become much inflamed, bleeding at the slightest touch, and losing the adhesion around the necks of the teeth, and to the alveolar ridge. Often there is excessive inflammation with increased heat along the line of the jaw, and of the mucous membrane lining the entire mouth and throat, and great dryness and huskiness in speaking. The patient experiences much pain in bringing the teeth together quickly with any degree of force. If this condition continues without amelioration of the symptoms, it is found that the mucous membrane presents disintegrated patches of greater or less size along its surface, even to such a depth as to destroy the epithelium, and form ulcers varying in extent. The throat assumes a grayish glossy appearance, and the tongue participates to a considerable degree. These ulcerations may extend on the surface or may deepen, in the latter case usually resulting in abscesses, which may eventually leave

fistulous openings along the jaw and through the gums. Where such is the case, the patient becomes a great and pitiable sufferer, and much time may elapse before he can use his lips or teeth for purposes of speech and mastication. Any of the preparations mercury may give rise to this variety of salivation. These preparations vary much in their power of producing this effect, in the period of causing it, and the extent to which this morbid action is manifested. But of all the forms of mercury, calomel or mild chloride is the most potent. The protoxide is also a powerful agent in this particular; especially so the deutiodide, while the bichloride may be administered to a considerable extent without giving rise to such accidents. If the bichloride is given in combination with the muriate of ammonia, it is much less liable to produce ptyalism. The same protection is noticed where the patient takes the chlorate of potash, either at the same time or after the use of mercurials. Many cases of salivation are caused by the external application of mercurial ointment, which is often used in dressing blisters, in extreme cases where it is desirable to obtain the rapid action of the remedy, and from application in the flexures of the body for the same purpose. It was formerly common to prepare a belt of kid or buckskin, or even of several layers of silk containing more or less of this ointment, to be worn around the waist of children affected with secondary syphilis from their parents. The citrine ointment and red precipitate of mercury, are often used for dressing indolent ulcers in children and even in adult patients. All these mercurial ointments are capable of giving rise to "mercurial salivation." It is particularly worthy of remark, (in all my observations in "mercurial salivation,") that children are less susceptible than adults to the action of mercury on their gums, the principal reason being, probably, because the elimination is more active in the young, and that the agents refuse to pass from the system without expending their full potency therein. It is well known that the constitutional action of mercury is much facilitated by combining it with

some preparation of opium for internal administration, and it is important that great care be exercised in watching action. When passed off quickly by the bowels, there is far less risk of salivation, than where its action is guarded by opiates. This opiate combination is often necessary where it is desirable to prevent mercurial diarrhœa, which is often obstinate and debilitating; sometimes in a patient with a rich fibrinous blood it is necessary to deteriorate it as quickly as possible. Such a course of administration is generally seen where much active inflammation is present, and where it is requisite to prevent a deposit of pseudomembrane, as in acute laryngitis or croup. The most expeditious mode of getting the prompt action of mercury on the system, is to introduce one scruple (20 grs.) of the mercurial ointment into the rectum, two or three times in twenty-four hours. This plan results, generally, in salivation in twenty-four or thirty-six hours, but while this mode of procedure is certain and speedy, it is none the less dangerous to the patient, for we quickly see supervening distressing signs of profuse salivation, often of long continuance and of great severity. When we have a case to deal with, where the patient has been salivated, we find the teeth and all parts of the mouth suffering from its effects in the manner we have before described. The patient tells you that he was salivated months or years ago, and since then the teeth have been more or less loose, the breath fetid, and an unpleasant taste always present in the mouth. It is always the duty of the dentist who has due regard for the patient's welfare as well as his own reputation, to relieve this diseased condition of the mouth, rather than to remove the teeth, (which is too often done,) before having made use of every expedient in his power to preserve them. It is rarely the case that the dentist sees such patients soon after ptyalism has been produced; generally it is months and years before the sufferer presents himself for professional treatment. I shall not burden my readers by a long detail of how ptyalism in its mild and severe forms ought to be treated, for even

dentist of long practice, with many such cases, has his own theory and practice. But for the sake of the young practitioners, it may not be amiss to make a few remarks upon its treatment, as the dark prospect of many cases need all the light that knowledge and judgment can shed to illuminate a pathway towards relief; and if I can afford any upon the subject I shall be amply repaid for my endeavors. Where the case is recent, the best mode is to give the patient tonic treatment, to keep the bowels open with small doses of epsom salts, to avoid salt food and to partake freely of such succulent vegetables as best agree with him, in order to relieve the scorbutic tendency of the system, to abstain from the further use of mercurials, and to use such washes for the mouth as have been found most beneficial in the condition referred to. Frequent washing of the mouth with cold water or cold infusion of some vegetable astringent often affords relief, if the patient will persevere with them, though it is generally best to prescribe some astringent or corrective wash, lest the patient becomes dissatisfied with the delay and apparent indifference of his dentist. One among the better applications, is a solution of one and a half drachms each of chlorate of potash and alum, in five ounces of water, with the addition of five ounces of strained honey. The chlorate of potash exercises a beneficial effect in all cases of inflammation of the mouth, especially where there is an ulcerous condition of the mucous membrane. Such is also the case where aphthae is present in children or adults. The chlorate of soda is just as good, having even the advantage of being a little more soluble than potash. Alum has a good astringent effect. Where much fetor is present, it is well to add one drachm of hyposulphate of soda to the wash; flavoring may be added to suit the taste of the patient or the fancy of the dentist; even the addition of a small quantity of creosote or carbolic acid, say ten drops, to the potassa mixture, will often have the good effect of gently stimulating the parts to heal, besides being a fine disinfectant. Tincture of myrrh is often used with good effect, giving it



the proper dilution, and adding a small quantity of the chlorate of potassa, a little creosote, and hyposulphate of soda to the preparation. Any astringent mouth wash will answer, even brandy has a good effect, being an astringent and gently stimulating. Should the diseased condition of the gums continue in spite of every effort to bring the parts to their natural state, we may resort not only to the above remedies, but to the free use of the lancet in scarifying the gums, bleaching, etc. If the disease is allowed to progress, periodontitis takes place, which ends in sudden or gradual destruction of the membrane, that gives life and vitality to the teeth, suppuration often commences, and we soon see severe abscesses forming around the alveolar ridge and necks of the teeth, with sometimes immediate loss of these organs; in other instances they drop out months or years afterwards, although perfectly sound, because of the absorption of the gums and the alveolar surroundings. The patient frequently suffers severe pain and becomes clamorous for relief by extraction, as an escape from his constant suffering, and the dentist now, has no alternative but to extract such teeth as he can clearly see are most affected.

Great discretion should be exercised in the use of the forceps, lest, in after hours, both he and his patient should see the error of too hasty extraction of these useful organs, when the dentist receives the censure of both his patient and unscrupulous members of the profession.

I fear I am carrying my subject too far, but, as I have before remarked, to the young practitioner it may be of some value. We may rejoice to know that our profession is making such rapid advancement in the knowledge of preserving these important organs of mastication, upon which the health and often the lives of our race depend, and that it is attracting the attention of all eminent practitioners of medicine. Many a dentist can enumerate cases where he has been called upon to treat, which some of the most eminent physicians have for months vainly endeavored to cure, and at last find that the skillful treatment at his hands restored the

anxious and suffering patient to health. It would be well for the patient, if every physician, when prescribing iron and other medicines compounded with acids, etc., so destructive to the teeth, would advise the use of liquor calcis, (lime and water,) or calcis carbonas precipitate; these being alkalis neutralize the acids, thus saving the teeth from their corrosive influences. Then, the physician would not hear that oft-repeated reproach, "Oh! Doctor, the medicine you gave me has made my teeth so sensitive and has put them on edge." I have spoken of the importance of preserving the teeth from the ravages of abusive medications, and space will not permit me to say more concerning the deleterious effects of disease of these organs upon the system. I will hope that this essay at "penning" in an interim of preserving, plugging and pulling, may offer practical suggestions to those of less experience than the writer; that it may serve to arouse from their lethargy abler pens than mine; that it may contribute to impress on us, one and all, the importance of preserving the teeth, and of counselling those who should be our auxiliaries—every physician, and every father, mother and child.

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### ARTICLE III.

#### *Heavy Foils and Heavy Mallets.*

By G. H. CUSHING, D. D. S.

Read before the Illinois State Dental Society.

The title of the paper assigned to me presents two entirely distinct subjects, which will of course be considered separately, and in the order in which they are named.

The subject of "heavy foils," presents for our consideration the most remarkable and complete revolution in ideas and practice which has ever occurred in the dental profession; one which, had it been predicted three months before it occurred, would have been scouted as utterly visionary and impossible by many, if not all, who were soon thereafter its first and most earnest advocates.

The tendency for many years past has been towards lower

numbers that is, to lighter foils; till No. 2, or that which contained but two grains to the sheet, was considered by many as the only foil which should be used by those desiring to secure the very best results. Now, when we come to the proposition, at once and with no intermediate steps, that No. 60, or foil weighing sixty grains to the sheet, is the best under most circumstances, and in fact the only style of foil which can produce first class results, we can realize something of the magnitude of the revolution we are about to discuss.

But more astonishing things have been known in the past, and we need spend no time in wondering at this extraordinary step in advance, if such it should prove to be, but at once proceed to the endeavor to understand the philosophy of this claim in favor of heavy foils, and to try and show what practical experience has demonstrated regarding their use. It will probably appear, upon a careful consideration of the subject, that there are good philosophical grounds upon which to base the claims made for these foils, and the absurdity of the proposition to substitute Nos. 30, 60 and upwards, for Nos. 2 to 6, will under this process almost disappear, while the fact which practical demonstration has established will confirm the theories.

In treating this subject it will be upon the assumption, of course, that the method of filling is by the use of adhesive foil exclusively. The requisites of a foil for this style of operation are, that it shall be as soft and pliant as possible consistent with its great adhesiveness, and at the same time that it shall be tough and tenacious, not liable to disintegration afterwards. Perfectly pure gold, properly treated and rendered as thin as possible by rolling, probably possesses these qualities in the highest degree, while lamination or beating out by the ordinary process, seems to deprive it in a measure, of these properties, particularly after the lower numbers are reached. The best article which has perhaps, been published touching the philosophy of this portion of the subject, is one from the pen of Professor Eames

of the Missouri Dental College, which appeared in the January number of the "Missouri Dental Journal," and to which I refer you for a more full statement regarding this feature. It has doubtless been observed by many practitioners, that the lower numbers of foil, of all makers, did not possess the requisite of a first class adhesive foil, to the same extent as the higher numbers—I refer to Nos. as high as 8 to 10.

In conversation with Dr. W. H. Morgan, of Nashville, some two months ago, he stated that he had observed this peculiarity for a long time, and had been gradually using higher numbers, in special cases up to Nos. 8 and 10, but at the time of this conversation, he had not become a heavy foil advocate, as that term is now understood, so that it would appear that the minds of some of the profession were turned in this direction long ago.

Who was the first to reason the matter out to its ultimate conclusions, I am not aware. So far as we are informed, Dr. W. H. Atkinson, of New York, first called the attention of the profession generally to the matter in this country, and Dr. H. J. McKellops, of St. Louis, was the first to introduce the practice in the West.

I am informed by Dr. Horace Enos, of Chicago, that Dr. Evans, of Paris, has been using foil as heavy as No. 120, since, perhaps, six years ago, and we may yet learn that others of the profession in the old country, have also antedated us in the use of heavy foils. But it was immaterial who was first, and as we have no account, so far as I am aware, of the reasoning on the subject, which brought the early advocates to arrive at their *highest* conclusions, we may endeavor to reason for ourselves upon this point. It is clear that if Nos. 8 and 10 were found, by experience, to be better than the lower numbers, in respect to adhesiveness, then higher numbers still, might reasonably be supposed to possess, in a greater degree, this essential quality; and if it was found that Nos. 8 and 10 were applicable in cases where before it was deemed that they could not be success-

fully used, it was then equally reasonable to suppose that still thicker gold might be employed in such cases, also advantageously.

These points could only be demonstrated by experiment, and so those first giving attention to this subject may be supposed, under the impulse of the above reasoning, to have tried experimentally heavier and still heavier foils, till the utmost limits were reached, and to-day we have some of the best men in the profession, advocating the use of foils of numbers raging from 60 to 120, and in some especial cases as high as 240.

Now, all that can be said in favor of this radical change in practice, would fail probably to convince the skeptical minds of the profession immediately. It is hardly to be expected that all the teachings of the advanced men of our profession, for these many years past, are at once to be set aside as all incorrect, and a new theory, so widely at variance with the old, to be accepted upon the mere affirmation of its advocates. We are, most of us like unbelieving Thomas, and can only be convinced by tangible proof and ocular demonstration.

Still I will endeavor to state briefly, the grounds which I conceive to be philosophical, in support of the claims which are advanced for heavy foils, and also, what experience seems to have established regarding their practical use.

To reconcile the claims of this great revolution in practice with the principles of philosophy, will be to make clear to our minds, the proposition that foil of the thickness of No. 60, is better than No. 2, for the purpose filling teeth, that it is equally manageable, is applicable in all cases where No. 2 was formerly considered to be almost the only thing that could be used, that it is more adhesive, welding more perfectly, with less force, and making a more solid filling. I think this can be established. In order to do this, we must go back to the examination of how No. 2, or other low numbers of foil are manipulated, and in doing this, I think we can easily explain away a fallacy which has prevailed

regarading the use of low numbers of foil generally.

The lower numbers of adhesive foil are used by either rolling it into pellets of various sizes, into ribbons or ropes of varying diameters and lengths, or folded upon itself with more or less irregularity into strips or blocks. I think it may be safely stated that the foil as it is generally prepared for use, presents a mass folded upon itself more or less irregularly, varying from ten to twenty thicknesses of the original foil, according to the sized pellet, strip or block. Now, when we use this are we not practically using Nos. 20, 40 or 60? In fact, we are using a heavier foil than the number of folds represents, for it is so folded upon itself in such irregular shape that presents an endless succession of surfaces and angles, braced in every conceivable direction, one against the other, rendering the mass more resisting than a solid sheet would be, which represented the number of folds we have in our pellet.

Herein, I think, lies the fallacy which has prevented many from seeing anything reasonable in the claims made for the heavy foils, viz: in ignoring the fact that we have practically been using heavy foils, though composed of a succession of layers of lighter numbers; and I think it must be readily seen that if we can pack twenty layers of No. 2 or 3, satisfactorily, we can equally well pack a single layer of No. 40 or 60, in the same place, and it certainly is sound philosophy to say that it can be packed more easily and perfectly, for the reasons mentioned before, viz: that in folding the lighter numbers upon themselves, no matter how regularly, we have a largely increased resistance to overcome, and largely multiplied surfaces to weld together.

Now, as it is well known that the less gold is hammered or beaten, the more it retains of the properties of adhesiveness, softness, tenacity, and pliancy, I claim that philosophy clearly establishes that the thicker the gold, (within certain limits,) which can be used, the more perfect will be the welding, and the more solid will be the filling. Thus much for the philosophy sustaining these claims.

Now, to consider briefly, what experience teaches concerning the use of heavy foils :

1st. That as high as No. 60, they are applicable in all classes of cases, where the mallet can be used, even in the most frail teeth, where the inexperienced in the use of these foils would think they surely could not be used ; but experience seems to prove that they are peculiarly adapted for use against frail walls, accommodating themselves to their irregularities with great facility, and requiring but slight force to place them properly, and in fact giving immediate support to the frailest wall, and thereby rendering the operation less difficult and less dangerous.

2d. No. 60 fills retaining points better than any other number, making more certain and solid anchorages than the lighter foils.

3d. They are much more adhesive, and when properly packed must make a stronger as well as a more solid filling while owing to the peculiar softness, as well as great adhesiveness of the numbers as high as 60 and upwards, they require really less force to condense them thoroughly, than the numbers from two to ten.

4th. In binding they are invaluable ; that is, where the cavity is approximal and the crown compounded, and the approximal portion can be but poorly anchored, as is sometimes necessarily the case, while a good anchorage can be secured in the crown—in such a case, by securing a strip of No. 60 or 120, in the crown, and carrying it over to the approximal portion, the filling can certainly be made more perfectly secure, than with light foils.

5th. In building out and restoring the contour, they make vastly stronger operations than anything of the kind done with the lower numbers could possibly make.

6th. They spread laterally, in condensing, to a much greater degree than the light foils ; and, finally, to sum up in a word their merits, they produce when properly packed the most perfect operations which have yet been attained.

Now, it may be said, and doubtless has been by many

"We must wait and see if these operations made with heavy foils fulfill the promise of their advocates, before we accept the new doctrine."

This is a very proper and natural caution, which we should all exercise, regarding new methods and practices, but I may remark, that it is very curious to observe how quickly these doubts disappear from the minds of the most skeptical when they have once given the matter a fair experimental trial.

I have three cases in my mind in which gentlemen experimented with the heavy foils, simply to prove their worthlessness. The foils were condemned in their minds beforehand, as utterly impracticable, and only tried by them at all, in order that they might be able to say, they had tried them, and the foils had proved just what they knew they would—worthless. All three of these gentlemen are now using the heaviest foils exclusively. The first experiments opened their eyes to the fact that their prejudices were unjust, and further experience only more and more fully establishes the superiority of the heavy over the light foils.

From my own experience, and that of others of my acquaintance, it would seem that all such doubts vanish before the "inexorable logic" of practical experiment. We are convinced in spite of ourselves, and the perfection of the operation of these foils becomes so established as we use them more, that there is not left any ground for even the most careful to say, "we must wait for time to prove the value or otherwise of this new method." I say this seems to be the case, and yet, perhaps, it is now too early to say that time will not prove that our present convictions are erroneous. My own belief is, that time will prove conclusively the truth of the seeming advantages of the new method.

With reference to the method of manipulation, it is difficult to write satisfactorily; one observation of an operation would teach more than twenty pages of written instructions, and I will only briefly state some of what I consider the



chief points to be closely observed. The foil should not be handled with uncovered fingers; it may be cut into pieces varying from one-fourth to three-fourths of an inch square, or into strips of proper width and length to suit the case. Where easy access is to be had to the cavity, the strips may be used to excellent advantage, condensing each layer across the whole surface, and folding the strip upon itself, thus saving time. The retaining points should be carefully filled, and the foil packed carefully from one retaining point to the other, securing and preserving as nearly uniform and plane a surface as possible, and the foil should be carefully condensed at and over the margins of the cavity, layer by layer. Care should be observed not to allow the foil to become very much crumpled or folded very irregularly upon itself. Rather small points should be used in packing it, as with them less force of malleting is required than with the larger points, while in finishing the operation of packing, great care should be observed to condense the entire surface thoroughly.

It must not be supposed that operations are greatly facilitated by using the heavy foils. My own experience thus far, is, that it requires longer to perform thorough operations with the heavy than with the light foils; but that should not weigh against them when the greater superiority of the operation is considered.

I have thus far spoken chiefly with reference to No. 60 and higher, which I consider as most desirable in a majority of cases, though Nos. 20 and 30 may be used to advantage in large fillings, for the principal part of the operation, as those numbers, when the cavity is favorable, can be packed more rapidly than the higher, while the heavier numbers should be used for the margin and finishing. I would also recommend these numbers to beginners, for their experiments, from which they will soon feel their way to the higher grades.

Before concluding what I have to say upon the subject of heavy foils, I would remark that since writing this paper, I

have been using foil of Nos. 30, 60, 120 and 240, which were not hammered at all, but produced by rolling, and they are certainly softer and more manageable than any I have used made by the ordinary practice of beating, and I think more adhesive. They seem to me, forcibly to corroborate the statement made in the first part of this paper, that "perfectly pure gold, properly treated and made thin by rolling, possesses the essential properties of an adhesive foil in the highest degree." This foil also possesses the advantage of presenting a dull surface, an advantage which those who have used the heavier bright foils will not fail to appreciate. R. S. Williams, of New York, is the manufacturer of the foils I now speak of.

In conclusion, I would earnestly commend the heavy foils to all who desire to secure the highest results, feeling confident that if these foils are fairly and properly tried, they will commend themselves far beyond anything that I could say in their favor.

#### HEAVY MALLET.

In speaking of the subject of heavy mallets I beg to say that when I proposed to write upon this, I hoped to be able to present some approximate explanation of the philosophy of the matter. But I shall make no such presumptuous attempt.

Some articles have been written upon this subject, and from one by Prof. Watt, it would seem as though the matter might be easily explained. My own researches and experiments do not lead me to that conclusion, and I shall only very briefly refer to the philosophy of the subject, and state the results of the practical observations, and of some few experiments instituted in the effort to elucidate the subject.

The whole doctrine of "impact" is involved in this discussion, and it is one which it would seem is but little understood, even by scientific men. In my endeavors to get light upon this investigation, I wrote to the editors of the "Scientific American," who replied to me that they knew of no work treating of "impact" in other than a "mathe-

matical way." They say "the subject is only amenable to mathematical investigation, and hence it is difficult to give a clear exposition in ordinary discussion."

But we can speak of the facts which observations and experience have established. What we require in a mallet is that it shall impact the gold properly, with the least possible injury to the tooth, and the parts surrounding it, and the least discomfort to the patient.

The theory of Prof. Watt, and probably of many others who have never used the heavy mallet is, that a light, elastic mallet is better than a heavy, non-elastic one, for the reason that the momentum of a light, elastic mallet, equalizing the momentum of a heavy, leaden one, being secured by greater velocity, imparts its force so quickly that there is no time for its distribution to any extent beyond the tooth itself. Now, if the force were not diffused beyond the tooth at all, or were we operating upon mere inanimate matter, this theory would be all very well. But we are operating upon living, sensitive tissue, with all the physiological conditions qualifying it, and with the light mallet the force is diffused beyond the tooth, and that only enough to occasion sometimes great soreness of the periosteum, and to render the operation consequently very painful. Now the heavy leaden mallet, moving at much less velocity for the same momentum, has its force diffused very much more, so that in a certain sense, the jaw and the head divide the force of the blow with the tooth and its immediate surroundings.

Experience demonstrates that as a rule the heavy leaden mallet is by far the least disagreeable one to the patient, while impacting the gold equally as well as the light elastic mallet, and my theory is, that it is for this very reason, because the force in that case is more diffused than when the light elastic mallet is used; and I think this is clearly reasonable, in view of what has been stated above.

But it does not appear why there should be so very great a difference. There seems to be something in the character of the blow dependent upon the material used, which has a modifying influence.

Mallets of almost every description have been used. Lead, steel, copper, wood, ivory, hard rubber, and rubber or wood faced mallets, with springs to break the force of the blow. You will find advocates for each and all these various kinds, but I feel very confident that when the matter has been fairly tested, the conclusion will be universally reached that an uncovered leaden mallet, weighing from six to eight ounces, will be preferred by nine-tenths of those upon whom they are used, and that the gold is equally as well and satisfactorily condensed.

I have personally tried faithfully the light wooden, the light leaden, the light hard rubber, the steel and the heavy leaden mallet; trying them all in the same mouth, and comparing them daily for several months, and have come to the conclusion stated above, that the heavy leaden mallet is universally preferred, except in very rare cases.

While attending the Mississippi Valley Dental Association held early in March of this year, Prof. Watt detailed experiments which he had been making, to demonstrate the action of different materials, and of different weights of the same materials as mallets, that is as to their relative "*vis viva*," or the amount of work which they would relatively accomplish in the way of impact before coming to a state of rest. The experiments which I afterwards instituted myself were suggested by those of Prof. Watt, and as I thought his apparatus not so constructed as to be uniformly accurate in its operation, I had mine made with a view to the greatest possible accuracy; and the results of my experiments satisfied me that the apparatus was all that could be desired for the purpose. It consisted of an upright board 18 inches high by 3 feet wide, set in a base of wood 8 inches wide, thus making a platform at the base of the board, in front, 3 inches wide. From in front of this board, at its central point, was suspended by means of an arbor running accurately in close fitting journals, a pendulum of steel wire, which could be lengthened or shortened at pleasure, and to which mallets could be attached, of any size or material.

Upon the platform at the base of the board, running grooves of brass, its base resting on the platform of wood was a brass box—weighted inside with lead—about 5 inches long by 2 inches high and  $1\frac{1}{2}$  inch wide, weighing altogether about three or four pounds; and upon the top of this brass box a steel bar was accurately fitted, to move lengthwise upon the box in nicely adjusted bearings; a set screw with a spring adjusted the tension of the bar at will. Opposite the bar and also the brass box, were fixed graduating scales of 24ths of an inch. These being set at zero, and so that the end of the bar should just touch the end of the mallet when it was hanging at rest, the mallet was drawn to a certain point and dropped, striking the end of the bar at a point of greatest momentum. The results of the blow were then evident of course; upon reading upon the graduating scales the distance passed over by both the bar and brass box, and thus was seen the relative effect of the blow upon the bar and the whole mass.

In this way, by comparing the results of blows produced by different mallets, was seen the difference in the diffusion of force due to the difference in the character of the material composing the mallet, as well as the difference of “*viva*.”

The experiments were limited for want of time, and none of sufficiently varied a character to demonstrate all that we seek to know, but they were somewhat astonishing in some respects, and I think contrary to the generally accepted theories concerning impact. I will briefly detail the experiments, which were conclusive as far as they went. There were each repeated eight times or more with most *remarkably accurate* coincidence of results. But one blow of the mallet was struck in each experiment.

The spaces on the graduated scales will be designated degrees.

|                      |   |                               |
|----------------------|---|-------------------------------|
| Lead mallet. . . . . | { | drove the steel bar 4 degrees |
|                      | { | whole mass .5 degrees.        |

|                                                    |                                                      |
|----------------------------------------------------|------------------------------------------------------|
| Lignum Vitæ, same weght.                           | { steel bar 5 degrees ;<br>whole mass .1 degree.     |
| Lignum Vitæ, with lead<br>ends, same weight. . . . | { steel bar 4 .5 degrees ;<br>whole mass .1 degree.  |
| Soft iron, same weight. . .                        | { steel bar 5 degrees ;<br>whole mass .4 degrees.    |
| Soft pure rubber, same wt.                         | { steel bar 4 .5 degrees ;<br>whole mass .4 degrees. |

The diffusion of force is apparent upon comparison of the distances passed over by the whole mass, and the steel bar moving upon the mass, the greater diffusion of course being where the whole mass was moved the greater distance relatively to the distance passed over by the bar in the same experiment. Thus, it will be observed, that in the first four experiments the lead seemed to exhibit the greatest diffusion, and the lignum vitæ the least, while the soft iron would seem to have the greatest amount of "*vis viva*." In these four experiments then, it would seem to be fair to presume that the difference in the diffusion of force here evinced, was due to the difference in elasticity of material used as mallets; the more elastic showing less diffusion; but when we examine the record of the experiment with the soft rubber, we find that the diffusion of force in this experiment seems to be equal, if not greater, than in the case of the lead mallet, and its "*vis viva*" to bear the same relation to the lead that its diffusion does. This certainly seems strange, and I do not propose to account for these phenomena at present. I only give these experiments as being curious and interesting, and showing the importance of experimental research in such investigations, and also in the hope that what has been said upon the subject may stimulate others to investigate it. The length of this paper, so much beyond what I had intended it to be, I should deem required some apology, if I did not feel that although for practical purposes this physiological demonstration is not needed, yet it ill becomes a body claiming to be scientific, to rest short of a thorough philosophical and scientific investigation of all

processes it may have occasion to use. In conclusion, I would state that the experiment with pure rubber surprised me greatly, but naturally suggested the inquiry in my mind, "if the action of the rubber in driving this bar so nearly approximates in results to the more solid, both elastic and non-elastic materials, why may it not be used to pack the gold as other mallets are? I made the experiment with it, having, however, little confidence that it would operate successfully for the purpose, and was much astonished to find, that apparently it effected the purpose equally as well as the other mallets, and in the case in which I used it, with much less suffering or annoyance to the patient. I only tried it in two cases, and cannot of course say whether it would generally be preferred, but I think it not improbable that it may prove valuable in certain cases of very lengthy operations, where the teeth are extremely sensitive to mal-letting with any material.

I propose to carry out these experiments in the future and hope when they are completed, to be able to say something more worthy of the subject.

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## SELECTED ARTICLES.

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### ARTICLE IV.

#### *Necrosis of the Lower Jaw from Undeveloped Teeth.*

By J. H. POSLEY, JR., M. D.

Mrs. B. æt. 30. Has had three children; health has been good until within the last year or two, when she became much debilitated from quickly succeeding pregnancies, and the care of a sick child, which died after a very protracted illness.

Her second dentition was irregular, two of the incisors of the lower jaw not making their appearance, and those which did come through being so uneven and misplaced that they were removed and false teeth substituted. About a year ago she noticed that the plate of her artificial teeth began

to give her pain and uneasiness; soon after this an indolent swelling made its appearance upon her chin, just beneath the lower margin of the jaw; this was opened, but very little matter came from it; the opening did not heal up, but remained open with everted mucous looking edges; subsequently a similar swelling made its appearance about an inch distant from it on the other side of the symphysis menti, and was also opened; like the first it gave exit to very little matter, and did not heal up, presenting in a short time an appearance exactly similar to the first.

When I first saw her (June 1869), these two sinuses were still open and discharging, presenting very markedly the peculiar appearance of openings leading to diseased bone; upon introducing a probe into either of them it came into contact with exposed bone. There was considerable inflammatory thickening around them; the integument was of a dark red or purplish color, and there was considerable elongation and projection of the chin.

Owing to the irritation produced by the examination, an abscess formed between the openings, which in contradistinction to the former ones, was painful, hot and throbbing; was opened in a few days, and gave exit to a considerable quantity of healthy well formed pus, but did not heal up, remaining fistulous like the others; there were now three openings along the margin of the jaw, one about the symphysis, and one about half an inch distant on either side of it.

For reasons which made delay advisable, nothing was done until Nov. 23d, 1868, when an operation was performed for the removal of the dead bone.

An incision was made along the lower margin of the bone, as far back as possible, extending about an inch and a half on each side of the symphysis and through the middle of the open sinuses, and the bone exposed. No detached bone was found, but that portion forming the projection of the chin was rough and carious; the whole of the diseased portion was removed by the saw, aided by bone nippers and



chisel, it being impossible to complete the section with saw without enlarging the external wound, which it was desirable to avoid if possible.

On the surface of the remaining bone was found a cavity, lying loosely in which was an incisor tooth, downwards, the crown and neck of which were carious and was removed and the cavity scooped out; it communicated with a small circular opening in the portion of bone removed, which in its turn led to one of the openings in the soft parts; on inspecting the portion of bone removed a section was found to have passed through another tooth, an incisor apparently not perfectly developed, but quite sound and healthy; it was firmly imbedded in the bone, but partially surrounded by a sinus, leading to another circular opening communicating with the other sinus in the soft parts. It could be seen an irregular groove, as though nature was engaged in undermining it and effecting its detachment. The surface bone remaining seemed to be perfectly healed. The patient made a good recovery, the wound healing slowly but soundly, the cicatrix retracted and out of sight and the red inflamed prominence of skin quite gone.

I feel compelled to regard this case as unusual and therefore interesting, as I cannot find any similar one referred to in Heath's very complete and recent monograph on diseases of the jaws, which I have looked over for that purpose. Forgeret on Dental Anomalies, is an account of errant teeth in cysts of the jaw. It may perhaps be a fair question whether these decayed teeth were the exciting cause of the bone inflammation, or whether the inflammation arose spontaneously, or otherwise excited, was identified and organized around these foreign bodies. The main reason against the first supposition is this having remained so long without giving rise to any trouble, but it must be noted that the lady's feeble and cachectic state of health at this time may have determined an attack of inflammation from a cause which would not otherwise have given rise to it.—*Medical Gazette.*

## ARTICLE V.

*On Amalgam.*

By DR. JAMES LEWIS.

From my earliest recollection, the Eclectic school of medicine, (as the botanists delight to be called,) have denounced mercury as an unsafe, aye, as a deleterious medicine.—Homœopathy, also, contribute its quota to the same denunciation; and though they have repeatedly demonstrated their hypotheses to their own satisfaction, mercury, in the form familiarly known to the physicians as submuriate, (Hy. Cl.,) continues to be the *sheet-anchor* of medical practice.

From my earliest acquaintance with dentistry I have been perplexed with the discussions relating to amalgam. Perhaps I have been unfortunate in never having found any peculiar conditions of the mouth that could, by the most remote possibility, have been attributed to the influence of mercury derived from an amalgam plug. I have examined a great many teeth that have been filled with this material, and when I have found the parts around them diseased, the origin of the difficulty was so entirely referable to conditions in which mercury was not involved, that to intimate mercurial disease would be unpardonable presumption. There are, undoubtedly, instances in which, on account of a peculiar diathesis, a patient is intolerant of mercury in any of its forms, (except as administered homœopathically—in which case a mathematical “differential” may be placed as the coefficient of the *quantity used*.) I have never, in dental practice, seen a patient possessing the peculiar diathesis. I will admit, however, that for such a person an amalgam plug, under certain conditions, *might* be a dangerous thing. We find persons who are also intolerant of opium to those persons who have no such idiosyncrasies; and when we have a patient who will bear calomel, its use, in given cases, is to be recommended, not condemned. To go back for another illustration: If we deprive ourselves of a useful agent, because the ratio of its *dangers* to its *utility* may be as 1 to

100, or even more, we might, with propriety, insist upon the abandonment of ocean steam navigation, for the reason that, occasionally, a vessel is so irrevocably lost at sea that the "spirit mediums" fail to render an account of the fate of its passengers.

Much of the argument against amalgam and its uses is simply *specious*. Writers who delighted to ventilate their ideas on this subject unconsciously pervert many of the most important facts and principles involved in our knowledge of electro-metallurgy, and their *speculations* upon the probable manner in which electric or electro-chemical forces manifest themselves in the human mouth, in connection with the substance of the teeth and of amalgam, show, to one who has patiently studied the laws of electro-chemical force, that they, (the writers,) have not yet reached even a tolerable comprehension of the subject; and when we come to consider their ideas of the pathology of the subject, we shall find, on careful scrutiny, that in some cases there is a palpable error of diagnosis, in others a disposition to condemn a substance, which, being injurious in one case, may be the *best* that is available in ninety-nine others.

I do not *advocate* the use of amalgams. I am just enough conservative not to deprive myself of a useful agent on account of a *prejudice*. At one time I was considerably influenced by the appeals of writers who sought to create a *prejudice* in the minds of the profession—(the writers themselves being evidently prejudiced)—and, for a considerable time, I argued with my patients to induce them to forego their use. It is scarcely necessary to say that this mode of doing business did not prove satisfactory, and I was *obliged* to use amalgam. Since that period I have studied amalgams with much interest, and in this connection I have also considered them as agents for the development of electro-chemical force, and their possible relations to the teeth, and to plugs of other material in the same or contiguous teeth. Probably some of my readers know the *secret* of the *white* amalgams. The best of them have the silver alloyed with

*cadmium* or *zinc*. For certain electro chemical reasons, zinc is preferable. The part that zinc plays in the compound is to protect the silver and mercury from the oxidizing influences of the fluids of the mouth. Zinc being the most highly electro-positive of any of the metals that can be used in such preparations, commends itself on the electro-chemical theory as an important adjunct in amalgam compounds.

Perhaps it may not be out of place to give my mode of preparing amalgam compounds. This I will endeavor to do as succinctly as possible, with my *reasons* for each particular. I prefer *coin silver* alloyed with *copper*. The presence of *copper* insures a greater degree of *hardness* than is attainable when it is absent, and in the presence of zinc it is as fully protected from electro-chemical action as the silver or mercury is. I melt the silver, and if it be chemically pure I add copper, about 8 per cent. to the argento-cupreous alloy. I add, while in fusion, zinc, about 5 per cent., after which the metal is cooled as quickly as possible. The alloy is then reduced (by means of suitable cutters secured on a mandrel in a lathe) to fine cuttings, which are afterwards passed through a very fine screen or sieve of brass wire gauze. To this I add also about 5 per cent. of *similarly screened cuttings of metallic zinc*, which helps to impart the necessary electro-positive character to the mass. Finally, I add from 50 to 80 per cent. *chemically pure silver in atomic division*, regulating the amount empirically, as it seems to be needed on testing portions of the mass from time to time.

I prepare my chemically pure silver by dissolving refuse silver, scraps and old plugs of amalgam in nitric acid. Filter the solution; add sufficient hydrochloric acid or chloride of sodium to precipitate all the silver as chloride, which chloride should be rapidly and thoroughly washed by frequent changes of pure water. The reason why I use chemically pure silver in atomic divisions is this: The *cuttings* of silver, no matter how fine, will have appreciable interstices between them, and an amalgam prepared from fillings or cuttings alone will inevitably become porous by the process of satu-

ration—the little fragments of silver being at first simply *coated* with mercury, finally absorb more, which necessarily drains the interstices. If, in the preparation of an amalgam, we can introduce some substance which will not greatly disturb the homogeneousness of the mass, and which will displace as much mercury as possible, we shall have secured two advantages. First, we obviate porosity. Second, we have to use *less mercury*. And in the result we obtain a *condition* of the mass in which mercury is obviously not available to the extent observed in some other forms of amalgam, for the production of such salts as may act prejudicially upon the tissues in the vicinity. In such an amalgam as I prepare the mercury cannot be twenty per cent. In a plug weighing five grains, we would find less than one grain of mercury. Allowing as large a surface of exposure as possible, which very seldom would reach as much as 0.25 square inches, the query arises: What fraction of a grain of mercury can possibly be absorbed from this mass in given time? and if it permeates the tissues as a *soluble salt*, how does it reach them? Is it through indigestion after undergoing solution in the mouth by the action of perverted saliva, or does the mercury in a metallic form pervade the structures of the tooth, or does it undergo solution in fluids pervading the tubuli of the teeth, and then find its way slowly into the adjacent tissue? We may declare our *opinions* on these points, but that is *not* demonstration. As I said before much of the reasoning on these queries is too *specious*, and it seems to me to assume the character of *special pleading* to sustain an *a priori* hypothesis. The chloride is then covered with water, say half an inch deep, sufficient sulphuric acid and metallic zinc being added to insure the reduction of the chloride to pure silver. When this is fully accomplished, as may be known by the entire disappearance of the white chloride, and the flaky or granular appearance of the dark metallic silver, the zinc may be removed, and the silver remain a few hours in contact with the unappropriated sulphuric acid to insure the solution of any remaining undissolved

solved portions of zinc. The silver is finally to be thoroughly washed with clean water, until *clean*, when it may be squeezed dry, or nearly so, in a napkin, after which it may be crumbled with the fingers, and more completely dried on a metallic plate over a lamp.

A few words relating to my mode of using this amalgam may not be out of place. Let the cavity be as carefully prepared as for a first-class gold filling. If the pulp cavity be endangered by the pressure necessary to insure a firm filling, cap with *osteoplastic*, or in any other mode that will secure permanence and security, dry the cavity by removing surplus saliva with a syringe, completing the process with any of the absorbents usually applied for that purpose. But, before the final drying of the cavity, mix the amalgam, and while it yet has a surplus of mercury, wash it with pure waters, to which a few drops of ammonia (alkaline) have been added, until the amalgam is *perfectly clean*. Remove surplus mercury by squeezing in a napkin, or any other convenient, suitable material. The amalgam is now to be packed firmly in the carefully dried cavity, using a surplus, in order to take up and remove the free mercury forced out of the mass by condensation, taking care that this part of the operation is thoroughly and efficiently performed. Dress the surface of the plug to a *contour*, and burnish it. After the plug has become somewhat hardened the burnishing may be repeated until the surface remains bright and smooth. Plugs of this character, in an average mouth, retain their brightness and seldom discolor a tooth—the *vitality* of which is sufficient to retain a plug of other material.

In *dead teeth* discoloration is very liable to ensue. This may be explained by attributing it to the evolution of gases containing *sulphur compounds*, which, it is known, are often evolved in appreciable quantities, from the decomposition of organic substances, and more especially those of animal origin. I have omitted to enlarge upon some points in my remarks, where it appears to me facts and reasons are so obvious as to suggest themselves.

In the amalgam question I do not propose to enter at large. Most of the discussions that are likely to arise in considering a subject in which the theory and practice of different persons is as different as can be, argument is so liable to degenerate into controversy, that the *main point* is lost to view in an endeavor to silence an opponent. A writer may sometimes be too busy or *too indolent* to fight his way out of a discussion, from which he will emerge without having achieved anything but opposition. In this matter I think I may claim the privilege of my age to plead an excusable amount of indolence.—*Dental Times*.

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## ARTICLE VI.

### *Neuralgia of the Jaw Bones.*

Prof. Gross, in *American Journal Medical Sciences, and American Practitioner*, says: "There is a form of neuralgia of the jaw bones which, as far as my information extends, has not hitherto been described. Its seat is in the remnant of the alveolar process of edentulous persons, or in the alveolar structure, and in the overlying gum, and is met with chiefly, if not exclusively, in elderly subjects. It is more common in the upper than in the lower jaw. The part affected is usually very small, often not exceeding a few lines in extent. The soft tissues around do not seem to suffer, at least not in the same degree; on the contrary, the morbid action is generally limited to the osseous structure. In rare instances there may possibly be some involvement of the gum, which is nearly always exceedingly hard and dense, grating more or less under the knife, and adhering with extraordinary firmness to the atrophied alveolar process beneath. The pain is generally paroxysmal, coming on in fits and starts, very much as in ordinary neuralgia, the slightest cause being sufficient to provoke it, as talking, mastication, the contact of hot or cold fluids, deglutition, or mental excitement. Sometimes it is momentary, coming and going with the rapidity of lightning; occasionally it lasts for hours

together; and cases occur, although they are rare, in which it continues, with but little mitigation, for an indefinite period. The pain varies in character; thus it may be sharp and darting, dull, heavy, aching, boring, or gnawing. Pressure generally relieves rather than aggravates it. Now and then, when it is uncommonly severe, there may be more or less spasms of the muscles of the face, but this is rare. The pathology of the affection seems to be compression of the minute nerves distributed through the wasted alveolar process, dependent upon the encroachment of osseous matter upon the walls of the canals in which they are naturally inclosed. The disease usually comes on gradually, and proceeds from bad to worse until, in many cases, the suffering is rendered nearly intolerable. The only effectual remedy is excision of the affected alveolar process. No particular attention need be bestowed upon the after treatment. A mild course of chalybeate tonics may be required when the patient is anæmic, or affected with flatulence and indigestion."—*Med. & Surg. Reporter*.

## ARTICLE VII.

### *Lancing the Gums in Dentition.*

H. Gibbons, M. D., in the *Pacific Medical and Surgical Journal*, says: "There are three objections to scarifying the gums: First, the pain and struggling of the child; second, the increased difficulty of teething arising from the cicatrix; third, the danger of hæmorrhage.

"As for the pain, it is trifling and unworthy of notice. The consequent relief is much more than sufficient to counterbalance the pain. Often the itching of the gums is so intolerable that the impression of the lancet is agreeable. I have known a child to close its jaws on the instrument and press it into the gum with evident satisfaction.

"The struggling of the child, and its fright, are of greater importance, especially if the operation be bunglingly done, as is often the case. There is but one right way of doing



it. Take your seat behind the child as it rests on the nurse's lap in a proper light, and placing your knees toward its back, draw its head down between your knees. Let the nurse hold the infant's hands. What with your knees and your two hands, the head is now completely under your control. Grasp it between your two palms, and as it opens its mouth to cry, thrust one or two fingers of the left hand into its mouth to keep the jaws apart, and use the lancet with the other hand. By this method you have the most perfect command of the head, and can cut exactly in the spot and to the extent you desire. I am thus precise in the description because I have so often seen the operation so awkwardly undertaken as to fail of its purpose, and to endanger serious wounding of the child's mouth.

"Some writers have recommended cutting down on the outside of the gum, toward the root of the tooth, and not on the ridge, in the perpendicular direction, toward the crown. If the gum be much swollen, and the tooth deep, this plan may answer.

"In some cases it is sufficient simply to relieve the distention by scarifying, without cutting down to the teeth. The loss of a few drops of blood in this way is often eminently useful, aside from any topical effect.

"The second objection, viz: the cicatrix, is scarcely worth a serious refutation. When we consider that the tooth effects a passage by inducing absorption of the gum through pressure, it is evident that absorption will be more easily accomplished where there is a cicatrix than where the tissue possesses all its original vitality and power of resistance. Repeated incisions, therefore, have an effect opposite to that which the popular mind ascribes to them. By weakening the vitality of the tissues they facilitate the exit of the tooth.

"The idea of induration, as attached to the cicatrix, is probably fallacious. I have never observed any induration of the gums, after scarification—perhaps because they heal up so speedily, and are kept constantly moist.

"Finally, we come to the most important objection—the danger of hæmorrhage. This is of rare occurrence. In an experience of more than forty years, during which it has always been my practice to use the lancet freely in dentition, not a single instance has occurred to me. I have heard the same testimony from my father after forty years of practice, in which he never hesitated to lance the gums of a teething child.

"Nearly forty years ago, this subject was canvassed in the Medical Society of Wilmington, Delaware—of which I was then a junior member. My recollection of that discussion is distinct. Eight or ten physicians were present, some of whom had been many years in service. The practice of cutting the gums was then universal. And yet not a single case of fatal or dangerous hæmorrhage had occurred to any one of them, and only one case had come within their knowledge. A child named Collins, the patient of a physician then deceased, had been visited, in consultation, by several of those present, and died after a number of days of hæmorrhage.

"But the experience of others is not uniformly of the same tenor. My friend, Dr. Hatch, of Sacramento, in a paper read before the Medical Association of that city, mentions four cases of hæmorrhage following incision of the gums, which have come to his knowledge—all of which proved fatal. In these, however, there was preexisting disease which, in all probability, would have destroyed life, had the gums been left intact. Further, they had been treated with calomel, until the peculiar effect of that agent on the blood appeared to be fully established. Dr. Hatch infers that the operation should never be performed on anæmic children, or on those whose appearance might lead to a suspicion of the hæmorrhagic tendency; and that it should be particularly avoided in patients under the influence of mercury.

"The experience of Dr. Hatch is exceptional and not to be accepted as a guide, in regard to the frequency of hæmi-

orrhage from this cause. It is extraordinary that so many cases should have fallen under the observation of a single practitioner. There have been deaths from hæmorrhage resulting from the extraction of teeth—perhaps as large a proportion as from cutting the gums. The same may be said of many other minor operations. But such extraordinary accidents are not allowed to deter us from operating, when occasion presents. I therefore conclude that the irritation of the gums from teething is so much more dangerous, under all circumstances, than the cutting of them with the lancet, as to justify the operation, without regard to consequences.”

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## ARTICLE VIII.

### *Deformity of the Mouth—Dieffenbach's Operation.*

The next case which I have to show you is Robert C., æt. 11 years ; suffering from a deformity of the mouth, resulting from the contraction of the cicatrix of a slough, which slough was one of the many concomitants of scarlatina, a disease which, as you know, may be followed by lesion of almost any structure or portion of the body.

You will perceive the left angle of the mouth is drawn downward and pulled in, or puckered in such a manner as to give an unpleasant appearance to his face, and he desires us to rectify this condition. This is not a common condition, yet it is sometimes met with from wounds, bruises, etc., and we must study the complications which exist in each case, governing our operation by the extent and character of the contraction.

In looking at a case of this kind you must bring to bear upon it all your artistic as well as surgical skill ; you must look at and view it in different positions, until you have decided what alterations are necessary to bring this deformed mouth into a normal condition, with the labial curves and commissures in their usual beautiful symmetry ; and, in order to do this, map out in your mind, or, still better, in

ink upon the face, the proper outlines of a perfect mouth ; then you can arrange your incisions to suit the particular deformity.

In the present instance the contraction is not so great as is often seen, where the orifice is sometimes so small as scarcely to admit of the passage of the little finger, and it is, therefore, comparatively an easy case.

For the relief of this difficulty, our first thought would be to merely incise the commissures to the required extent ; but unfortunately such a procedure would only be followed by speedy union and greater consequent contraction than before since it is impossible to prevent union of the fresh surfaces, even though tents, lead, ect., be placed between the edges.

Mechanical dilatation gives severe pain and does not produce any permanent good.

The only method which has proved of service has been that of Dieffenbach, of Berlin, which is performed by the surgeon first introducing the fingers of one hand into the mouth of the patient, in order to guide and direct the incisions and make the cheek tense, during which time he should stand either behind or in front of his patient, according to the side of the mouth upon which he is to operate, and then inserting the blade of a pair of scissors into the cheek about two lines outside the point which he intends shall be the labial commissure, he cuts inward and upward, dividing all the tissues save the mucous membrane, until he has reached a point in the upper lip which will when brought down, fulfill the required conditions. Again, a similar incision is made from the same starting point, but this time, toward the lower lip which, in turn, is divided nearly to the same extent as above ; the cuts in each instance being varied to suit the irregularities in the position of the contracted orifice. Next dissect away the flesh down to the submucous coat, thus leaving but the mucous membrane, which must in its turn be divided by a straight line running out its centre, to a point two lines inside the angle of external incision.

The mucous membrane is now turned over to imitate the

normal lip, above and below on each side, and, its edges sutured to those of the skin, thus forming the vermillion border of a new lip.

This operation usually answers admirably, but sometimes unfortunately, the mucous membrane also participates in the lesion, and the operation cannot be successfully performed; or again, certain accidents may come between the surgeon and success, and cases will be found where this operation will not cure.

In such cases I am in the habit of modifying, or rather of adding to, or associating a mechanical appliance with these surgical means.

This consists of what might be called a "month stretcher," an instrument made of wood or rubber, with a deep groove around its border, which is slipped between the lips after time has been given for union of the reflected mucous membrane. The lips will be caught and held by the gutter of the apparatus, in the whole of their circumferences, and thus not only is the healing influenced to a desired shape, but undue cicatricial contraction is also prevented. This instrument should be worn constantly for a week or two, after which time its use should be continued at night until all contraction has ceased. This apparatus also does more than merely prevent contraction; it may even remedy defects which are the fault of the operator, by compelling the regular healing of the wound, and such mistakes and blunders you will make unless you carefully weigh each cut, and look at it in various aspects—you must bring all your mechanico-surgico skill into use.

[The incisions were then made as described, the tissues being removed down to the mucous membrane, which was brought over and firmly stitched to the integument. At each step of the operation the case was viewed both from a near and distant standpoint, thus rendering the final adjustment a more perfect success. The hemorrhage was but slight, and soon ceased. Cold water dressings were applied, and the boy directed not to exert and strain upon his mouth

until union should be well accomplished.—DE. F. W.]  
Clinic of Professor Garretson, University of Penn.—*Medical & Surgical Reporter*.

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## ARTICLE IX.

### *Are the Mineral Acids Formed in the Mouth?*

By PROFESSOR CHASE.

I propose to take the affirmative of the above proposition, and I shall attempt to show that the powerful mineral acids, sulphuric, nitric and hydrochloric, are formed in the mouth under certain circumstances; namely, when the food is allowed to remain around, upon and between the teeth day after day. They then are constantly being formed slowly, and in small quantities, to be sure. It is conceded by all who have given the subject any thought, I believe, that *organic* acids, such as *lactic*, *acetic*, etc., exist in the mouth, under certain conditions, in sufficient quantities to be detected. This is a well known fact and will not be denied, and it is not probable that they alone are the only acids which cause such disastrous results to the dental organs. It is true, the only positive evidence we have that nitric and sulphuric acids are ever present in the oral cavity, are the effects which they produce upon the teeth; but as for hydrochloric acid it has often been detected by reagents.

It seems to be a pretty well settled fact that dental decay is due to the action of certain acids, and if we knew to what acid or acids this action was due it would be an easy matter to apply the proper remedies.

I will now proceed to consider the action and formation of the different acids, and see if under any circumstances they could possibly be formed in the mouth. I will commence with

**SULPHURIC ACID.**  $H_2SO_4$ . As its formula indicates it is composed by weight of two parts of hydrogen, sixty-four of oxygen and thirty-two of sulphur. A great number of the nitrogenous compounds, as albumen, caseine, gluten, &c.,

besides containing carbon, oxygen, hydrogen, and nitrogen in their composition, have a trace of sulphur. If for example a fibre of meat is caught between the teeth and allowed to remain there a sufficient length of time, it will undergo decomposition, a part of its hydrogen uniting with part of the nitrogen, forming ammonia,  $\text{NH}_3$ , its carbon uniting with part of oxygen forming carbonic acid  $\text{CO}_2$ , and the sulphur combining with the remaining hydrogen forming sulphuretted hydrogen, in contact with the oxygen of the air, is decomposed; the hydrogen uniting with the oxygen, forming water, and the sulphur set free. This sulphur being in the nascent state and having a great affinity for oxygen, is oxidized, and the result is *sulphurous acid*  $\text{SO}_2$ , which is converted rapidly into *sulphuric acid* in the presence of the water of the saliva; thus  $\text{SO}_2 + 2\text{H}^2\text{O} + \text{O} = \text{H}_2\text{SO}_4$ . The acid thus formed immediately acts upon the carbonate of lime, decomposing it, and charring the animal portion. This acid can neither decompose the phosphate of lime nor dissolve it. Therefore the latter, with the animal portion of the tooth, acts as a barrier, protecting the portion of tooth beneath it. It is probable that the "black variety" of decay, where but little of the tooth substance has been removed and the disintegrated portion is tough and cuts like leather, is caused by the slow but constant action of sulphuric acid. The acid blackens the organic or animal portion of a tooth by its great affinity for water, therefore it causes a portion of the oxygen, and hydrogen of the organic substance to unite, *forming water*, leaving an undue portion of carbon, which gives it its black or brown color. Owing to the small amount of sulphur which is present in the mouth under the most favorable circumstances, it necessarily follows that but a small quantity of sulphuric acid would be formed, and this immediately acting upon the teeth or some ingredient of saliva, may account for its never being discovered in the mouth in an uncombined state.

*Nitric Acid*—Symbol  $\text{HNO}_3$ , is, as its symbol indicates, composed by weight of one part of hydrogen, forty-eight

parts of oxygen and fourteen parts of nitrogen ; in one hundred parts we have hydrogen 1.59—, oxygen 77.19+, nitrogen 22.22+.

It is commonly prepared by the action of sulphuric acid upon potassium nitrate; the reaction is as follows:  $\text{KO}_3\text{N} + \text{H}_2\text{O}_4\text{S} = \text{KHO}_4\text{S} + \text{HNO}_3$ . Nitric acid is characterised by its great affinity for bases and for its property of furnishing oxygen in its nascent state to oxidizable substances. It acts energetically upon a tooth, decomposing the carbonate of lime, setting carbonic acid free and forming the nitrate of lime and water, thus:  $\text{CaO}_3\text{C} + 2\text{HNO}_3 = \text{Ca}_2\text{NO}_3 + \text{CO}_2 + \text{H}_2\text{O}$ . It cannot decompose the phosphate of lime, but readily dissolves it. It decomposes and destroys the animal portion of the tooth.

Thus we see that nitric acid removes each constituent of the tooth as soon as it comes in contact with it, either by decomposing it or dissolving it. This powerful acid is sometimes administered as a medicine, as is also sulphuric and hydrochloric; but probably not sufficiently often to account for its effects which are constantly seen upon the teeth according to the observations of many practitioners. Watt says "It is the principal agent in the production of the "white decay." By the putrefactive decomposition of any nitrogenous substance ammonia is evolved. And although nitrogen has a very feeble affinity for oxygen, yet under certain circumstances it combines with it, and forms several different compounds; and is it not reasonable to suppose that when some albuminous substance is undergoing decomposition in the mouth some of the conditions are present for the formation of some oxide of nitrogen? Although this has never been demonstrated, yet I think it very probable, for hundreds of chemical combinations and decombinations are taking place throughout the organism every hour that could not take place outside the body except under entirely different circumstances; for instances, hydrochloric acid is found in the gastric juice; this must evidently have been formed in the body by the decomposition of some chloride,



the chloride of sodium probably. Now to generate hydrochloric acid outside of the body by the decomposition of this salt requires a greater heat than that of the body. Suppose that an albuminous substance is decomposed and *nitric oxide* NO, is formed which is not improbable; this coming in contact with the oxygen in the saliva is immediately converted into *nitric trioxide* N<sub>2</sub>O<sub>3</sub>, and this in the presence of the water in the saliva is decomposed into nitric oxide and *nitric acid*. The reaction is as follows:  $3\text{N}_2\text{O}_3 + \text{H}_2\text{O} = 2\text{HNO}_3 + 4\text{NO}$ . Thus by the decomposition of a particle of meat or a portion of the gluten of flour, or of epithelium we may and probable do have formed one of the *strongest acids*. Watt says that the ammonia which is generated "exposed to the action of oxygen is *always* decomposed, an oxide of nitrogen being formed, and of course *nitric acid* is the result." Hydrochloric Acid. Symbol HCl, is as its name indicates, composed of hydrogen and chlorine. The action of this acid dilute upon the teeth is very energetic. It decomposes the carbonate of lime, forming the chloride of calcium and liberating the carbonic acid; the hydrogen of the acid unites with part of the oxygen, forming water, thus  $\text{CaO}^{\text{C}}\text{--}|-2\text{HCl} = \text{CaCl}_2\text{--}|- \text{H}_2\text{OCO}_2$ . The phosphate of lime is not decomposed but is very soluble in the hydrochloric acid and in this way is removed from the tooth. If the acid is strong some of the organic portion of the tooth is also acted upon. The action of the acid upon the teeth may account for that variety of decay where the inorganic portion is removed and the animal portion remains.

Now the question arises, how is the acid formed in the mouth? As I said before, it has frequently been detected by means of reagents. The chlorides of sodium and potassium are always present in the saliva, and it is undoubtedly formed by the decomposition of one of these salts, its chlorine combining with the hydrogen of the water; and thus the acid is formed. Again if there were different metals in the mouth, such as gold fillings and those of amalgam; or a gold plate, and plugs of some other metal or *vice*

*versa*, we would have galvanic currents which would readily decompose the water and the chlorides, setting the elements free, and each one would unite with the one for which it had the greatest affinity. Now, hydrogen being an *electro positive* element, and chlorine *electro negative*, their affinities for each other consequently great, they would unite, and the result would be hydrochloric acid.

The soluble chlorides are no doubt decomposed by other means which we may never be able to demonstrate. Probably no man would pretend to say just how every chemical change in the body took place. These are some of the mysteries which, it would seem, were not intended for us to know.

In this paper I do not wish to be understood as intimating that the decay of teeth is entirely due to the action of the mineral acids, far from it; but I do think they exert a great influence upon dental decay, and in some cases it may be that it is entirely due to their action. The action of the organic acids that are found in the mouth no doubt is about the same as the other acids, but much less rapid in their effects.  
—*Missouri Dental Journal*.

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## MONTHLY SUMMARY.

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*Carbolic Collodion*.—Dr. J. M. Hirsh of Chicago, has published in a new Journal, *The Arts*, a description of the method of preparing his new mixture for stopping hemorrhage. Taking advantage of the astringent property in carbolic acid, which even in dilute solution will check the flow of blood, he prevents external coagulation—objectionable on account of its liability to break off and allow the flow to commence anew—by adding to the carbolic acid, phenol collodion, which almost instantly forms an artificial covering closely fitting the wound, so that coagulation has to take place within or beneath this coating. Ordinary collodion, which is a solution of gun cotton dissolved in ether, contracts greatly upon the evaporation of the latter, and frequently scales off. To obviate this he uses glycerine, which has the property

of rendering the collodion elastic. He finds that carbolate of glycerine is soluble in all proportions in collodion. The highly irritating and poisonous property of carbolic acid suggests that it should be used very sparingly in this compound.—*Medical and Surgical Reporter*.

*What Fruit-Syrups are Composed of.*—On examination of a number of fruit-syrups, a chemist in Brussels found them to be grape sugar syrups, colored with aniline colors and flavored with a few drops of the common fruit essences. 200 grains of syrup were found to contain 0.05 grains of fuchsine, which is not without danger, on account of the arsenious and arsenic acid frequently contained therein.

Genuine fruit-syrups lose their color by chlorine ; those colored with aniline derivatives give at the same time a flocculent precipitate, similar to that produced by ammonia in solutions of sesquioxide of iron. Sulphurous acid destroys the color of both ; sulphuric, hydro-chloric, and nitric acid render the color of genuine syrups brighter, and change the artificial ones into yellowish orange. Potassa decolorizes fuchsine syrups, while red fruit-syrups acquire a dirty greenish hue. Carbonate of potash does not change the color of artificial syrups, while the others are colored green. Basic acetate of lead gives with real fruit-syrups a greenish precipitate, with fuchsine syrups a red one.—*Medical and Surgical Reporter*.

*Spontaneous Combustion.*—*L' Union Medicale* of the 15th of February, contains an article from the pen of Dr. Bertholle, wherein full details are given of a case of spontaneous combustion. The subject of it was a woman, thirty seven years old, who was addicted to alcoholic drinks. She was found in her room with the viscera and some of the limbs consumed, the hair and clothes having escaped. The very minute description of the state in which the deceased was found, shows that ignition could not have been communicated from without, and, to all appearance, this is an additional case to those already upon record.—*Lancet*.

*Influence of Diet on the Composition of Bone.*—Some very interesting experiments have been made by M. Papillon, and communicated to the French Academy. M. Papillon fed pigeons

and rats with food containing small quantities of phosphate of strontia, phosphate of magnesia and phosphate of alumina. The substances were given daily in small doses for several months without any visible effect on the health of the animals.

On afterwards making an analysis of the bones of the pigeons, there were in a hundred parts of the ash of the bone :

|                            |       |
|----------------------------|-------|
| Lime.....                  | 46.75 |
| Strontia.....              | 8.45  |
| Phosphoric acid.....       | 41.80 |
| Phosphate of magnesia..... | 1.80  |
| Residue.....               | 1.10  |

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99.90

The ash of the bones of the rats furnished in like manner, in Specimen 1:—

|                          |       |
|--------------------------|-------|
| Lime.....                | 41.10 |
| Alumina.....             | 6.95  |
| Phosphoric acid, &c..... | 51.95 |

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100.00

In Specimen 2:—

|                          |       |
|--------------------------|-------|
| Lime.....                | 46.16 |
| Magnesia.....            | 3.56  |
| Phosphoric acid, &c..... | 50.29 |

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100.00

It is very remarkable that strontia, magnesia and alumina can be made to enter into the composition of bone by means of an appropriate diet. A fact of this kind is calculated to raise our hopes in the possibility of modifying the animal body by means of medicines. Possibly ossification of the arteries is capable of being stopped by an appropriate diet.—*Lancet*.

*Transformation of the Hydrate of Chloral into Chloroform in the Human Organism.*—M. Personne's communication on Chloral, has been brought before the Academy of Sciences. The results of his experiments point to the transformation of chloral into chloroform within the human organism. His experiments were conducted in two ways. First, chloral was directly mixed with the blood of an ox; next, the substance was given in toxic doses to a dog, which was slain when in a condition of complete anæsthesia. The blood of both animals was examined, and not the slightest trace of chloroform was to be detected by the smell.

But when M. Personne, thinking that the smell of chloroform was necessarily covered by that of the blood, resorted to other means of investigation, he arrived at quite different results. A chemical analysis of the fluid was made, and then it was discovered, by employing the usual means for the detection of chloroform, that a large quantity of chloride of silver could be obtained from the blood which had been directly mixed up with the chloral, and a less quantity from the blood of the dog which had absorbed the substance. As the objection might be made that the chloride of silver does not result from the transformation of chloral and the consequent introduction of chloroform into the blood, M. Personne at once tells us that he could obtain the chloride of silver only when a small quantity of carbonate of sodium was added to the hydrate of chloral. Thus, he says, the alkali in this experiment has alone transformed chloral into chloroform, as does the alkali of the blood. The same results were obtained on examining the residue found in the stomach of the dog; and M. Personne states that absorption through this channel is extremely slow. Examination of the urine furnished no traces of chloroform—a fact which is in contradiction to what Dr. Bouchet has recently observed.

M. Personne has come to the conclusion "that hydrate of chloral does not pass through the human organism without undergoing a transformation, but that on reaching the blood it is separated into formic acid and chloroform, which latter substance is subsequently converted into chloride of sodium and formiate of soda, the products of its elimination."—*Lancet*.

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## BIBLIOGRAPHICAL NOTICES.

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*Deformities of the Mouth, Congenital and Acquired, with their Mechanical Treatment.* By James Oakley Coles, Honorary Dentist to Golden Square Hospital for Diseases of the Throat; Member of Odontological Society of Great Britain, etc. Second edition. Revised and enlarged. Publishers, Lindsay & Blackiston, Philadelphia.

This valuable contribution to dental literature, on the treatment of congenital and acquired defects of the palatal, is embellished with no less than twenty finely executed colored plates, and fifty-one wood cuts, and presents this subject in a comprehensive and impartial manner, credit being given throughout the

work to all who have suggested improvements in methods of treatment. The author in describing his principles of treatment, remarks that it is based on the inventions of Dr. Kingsley, but considerably modified, and that much as he believes in the soundness of that system of curative dentistry, introduced by Dr. Kingsley, and followed out since by so many others besides himself, he is by no means wedded to his belief to such an extent as to undervalue the merits of surgical operation for congenital cleft palate. The work is dedicated to Sir William Fergusson, the eminent English surgeon, and will prove a valuable aid to all who are interested in the treatment of defects of the palate.

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*Descriptive Catalogue of the New Sydenham Society's Atlas of Portraits of Diseases of the Skin.* By Jonathan Hutchinson, F.R.C.S. Part I. Lindsay & Blackiston, Philadelphia.

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*The Physician's Visiting List for 1871.* Lindsay & Blackiston, publishers, Philadelphia. For several years past we have been using this work as a dental appointment book, and find that it answers the purpose admirably.

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## EDITORIAL DEPARTMENT.

*The Baltimore College of Dental Surgery.*—The *Thirty-first* annual session of this institution commenced on the 17th of Oct. last, with Infirmary practice and preliminary lectures. The corps of Dental Demonstrators has been increased to *five*, and an additional room fitted up for the Infirmary practice, in order that every facility may be afforded the student for acquiring practical knowledge. The Infirmary is now open during the entire year, the good effect of which course is apparent in a largely increased practice.

The number of patients applying each day for operations, is far in advance of other years, especially at the opening of the session.

The number of students in attendance is as large as at the same period last year, and in quality, gentlemanly conduct and application, would do honor to any institution in the land.

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*A Singular Tumor.*—MR. EDITOR:—As it has become quite fashionable to report every case which has any peculiarities to the writer himself, whether they appear so to others or not, I have thought to tell you of one which came under my observation a short time since, and should you deem it worthy, are welcome to give it publicity.

Mrs. B., aged 28 years, lymphatic temperament, general health good, sent for me some time during the summer (I did not at the time note the date) in haste, the message stating that she was bleeding profusely from the mouth. The distance being short, I was with her in a few moments, and found the hemorrhage coming from a polypoid tumor, or excrescence growing out from between the last two upper molar teeth of the left side. On the lingual surface the tumor was about the size of a small chinkapin, and was exceedingly vascular in structure, resembling very much in appearance a placenta.

The remedy in the case was to remove it, since there was no chance to arrest the hemorrhage without, and even if such were possible, it was best to remove it. There was no difficulty in detaching by tearing it away with the fingers. The bleeding ceased upon applying nitrate of silver, and all went well for the time. Now what renders the case interesting, none the less to medical men than to dentists, is the fact that the lady was about five months gone in pregnancy with her fifth child, and that the *polypus*, (for such it was,) lost no time in reproducing itself, which it continued to do, and be removed every four or six weeks, until Christmas morning, when she was delivered of a healthy child, at which time it stopped growing. I examined her mouth only a few days since and find nothing unnatural, save a slight bluish appearance about the gums, from which it had grown. Now, another fact worthy of notice is, that the above is the history also of the pregnancy next preceeding the one of which I write, and in this as in the last, it ceased to grow on her being confined, and commenced again on her becoming pregnant.

I would like to have the opinion of some one skilled in pathology, as to the rationale of this *affection*, since in summing it up I have arrived at the following very plain conclusion, that is, that pregnancy produces it, delivery cures it, and to prevent it, she must not again become pregnant. As to how and why such should be the case the writer ventures not an opinion.

JOHN C. STOREY, M. D., D. D. S.

*Welch's Rubber Solder.*—This is a new preparation for repairing vulcanite work, and in the several cases in which we have tried it, answered the the purpose admirably, although sufficient time has not elapsed to test its durability.

Benzine appears to be the solvent, and it evidently owes its efficacy in a great measure to the presence of this agent. The following directions are given for the application of this preparation: "Invest the case in plaster, leaving the part exposed to which it is desired that the new rubber shall adhere. Scrape this surface clean, and with a camels hair brush coat with the liquid, allowing it partly to evaporate; then apply new rubber slightly warmed, press the parts of the flask together, and vulcanize." It is claimed that the union will be as strong as any other part of the work.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.    THIRD SERIES--DECEMBER, 1870.    No. 8.

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ARTICLE I.

*Vitality and the Vital Forces.*

Lecture by Prof. H. R. NOEL.

Physiological Department, Baltimore College of Dental Surgery.

*Gentlemen*:—In the preceding lecture we have discussed the “Correlation of the forces” in the inorganic world, and have endeavored to demonstrate their mutual convertibility and to show that though we can change the *form* of force, we cannot destroy it; that as man cannot create one atom of matter, so he cannot create one iota of force; and as he cannot destroy matter, neither can he destroy force, for it is “continuous and indestructible”(Grove.)

We wish in the following lecture to show you, that these expressions of force in the inorganic world, and which we have been calling; *motion, light, heat, electricity, magnetism &c.*, have a most direct and important bearing upon the first principles of a scientific physiology.

We defined physiology to be “the study of the body as a complex machine in full motion” and said that properly it should embrace *first, its construction; second, its maintenance; third, the functions of systems and tissues; fourth, the laws and conditions of their action.* In construction, or the process called Histogenesis, by which the tissues, organs and systems are evolved, we shall find that these physical forces



enter, as an essential element into the initial stage and remain essential until death stops the machinery. We are accustomed to use the terms Life and Vitality in a most indefinite manner, and we look upon all expression or forms of Vital Force as being intensely mysterious and utterly inexplicable; now while we do not hope to entirely clear up this mystery, we do propose to attempt the removal of some of the obscurity and confusion in which this subject has been so closely enveloped.

To appreciate the full value of this word Vitality, we must analyze its applications, and from these analyses, eliminating all extraneous matter, we can arrive at an approximately accurate idea. By way of illustration, we may say, *first*, grains such as corn, wheat, oats, possess vitality, *second* trees possess vitality, *third*, grass possesses vitality, *fourth*, the herds, which consume the grass, possess vitality; *fifth*, man, who consumes these herds, possesses vitality. If we proceed to a critical examination of the above statements, we will find that this element which is common to both the animal and vegetable kingdom, can be expressed very readily when the idea of *force* is adopted; we will call this, "*Vital Force*" for the present.

This force has three forms or modes of manifestation, *first*, *assimilative*; *second*, *reproductive*; *third*, *developmental*; it is very evident that upon these three points plants and animals are equal; a plant can assimilate food (carbonic acid, ammonia, water, saline matter) can vitalize and incorporate this material, so as to make it a part of itself, and thus it can grow, develop and reproduce its kind; an insect, an animal, a bird for example, possesses the same forces, and may give us the three expressions of vital force.

Vitality, therefore, as shown by its manifestations of force, has its expression by forms the same in the vegetable as in animal kingdoms, and hence these have received the names of, the "*Vegatative Forces*," the "*Nutritive Forces*," the "*Forces of Organic Life*."

You will at once appreciate the fact, that as they are

active in the vegetable world and as vegetative life is essentially a constructive process, these *forces* must be essentially *constructive*. Indeed their very essence is this constructive action, and we shall find that this nature, so clearly demonstrated in the lower world is found equally as potent in the higher, and the histogenetic forces of the plant are the histogenetic forces of the animal, while the laws and conditions of their exhibition, are at least analogous and parallel if not identical.

If therefore the physical forces, light and heat, acting upon a vegetable germ, will cause the evolution of the vegetative forces, and thus give an exhibition of vitality, will not the same results ensue from these physical forces acting upon the animal germ?

These forces called vegetative are constructive, and one of the first steps must be the construction of the systems, or machinery of the animal, for they must be constructed before they can be worked; the organs, tissues &c., must be built or produced before the phenomena of their action can be observed; we should therefore infer that physical forces would develop in the animal germ exactly the same exhibitions of force that are developed in the vegetable.

To better illustrate this truth, and at the same time give you a practical idea of the power of the physical forces, we will take "HEAT" as their representative and pass it first through a vegetable germ and then through an animal germ. The form of force which we call HEAT, is the one specially *adapted* to this experiment and its action is interesting in the highest degree.

A grain of wheat, which has lain 3000 years, wrapped in the cerements of an Egyptian mummy, will when supplied with heat and moisture, germinate; by germination we mean simply to state in ordinary language, that this wheat is still capable of exhibiting the three powers, or three manifestations of vegetable life—it possesses: 1st the Assimilative, (2) Developmental, (3) Reproductive. The Heat acting as a "Dynamical Stimulus" seems to change its form,

and reappears as a *Vegetative Force*; it is apparently *lost as heat*, but *regained as vitality*.

Now in the animal world, we will take as the most appropriate example, "an egg."

The egg is perfectly familiar to you, and yet it will give you a most happy means of illustrating the power of heat. The egg consists of two very different substances: (1) A germ, (2) food for this germ; the whole egg is not a germ—but only a very, very small portion—a mere speck is the true germ; now if we apply a certain amount of heat and apply it continuously for a given period, this force which we call heat, acts upon the *germ* and determines changes in it—and this germ at once exhibits the vegetative forces; it first assimilates a portion of the food or yolk, and thus grows; then it begins to develop, and if the heat be continuously applied, the whole supply of food (i.e. yolk and white) is assimilated, the developmental force is exhibited, and a living animal is produced.

On the other hand, if the heat be too long withdrawn, or entirely withdrawn, there is a sudden arrest of all vegetative changes—vitality ceases and chemical decompositions ensue; the egg in a short time becomes putrescent. You will please notice, that "Heat" inaugurated the vegetative changes, and that vitality continued as long as this "physical force" was supplied, but ceased upon its withdrawal. The changes were those of nutritive life—organic life—vegetative life; they were begun by heat, continued by heat and ceased when heat was withdrawn; now this looks as if *Heat* passed through an organic gerum may become lost as heat and yet reappear as vegetative force. In other words, a given physical force, *Heat*, may be correlated through an organized structure into vegetative force and reappear as that mysterious thing, *Vitality*.

Vitality then is not to be considered as an entity, as a thing distinct in itself, but as a manifestation of force through organized structure; vitality is inseparable from organization; apart from organization we know nothing of vitality; and

I may as well add, that even with organization we have no knowledge of vitality, save when an organized structure, or organic germ is acted upon by the physical forces ; these are the *dynamical conditions* of life.

It has been said that there is in the "grain of wheat," and also in the 'egg,' a *Dormant Vitality* ; that may be true, but to us, it is of no practical value, since without the addition of the physical force *heat*, we would have remained ignorant of its dormant presence. It is the physical force, which entering the organism, loses its form of expression as a physical power, and reappears correlated—correlated into vegetative force—correlated into *assimilative, reproductive and developemental force*.

I do not wish to be misunderstood upon this point, so I therefore assert, that I do not say heat and vitality are identical, but I do most positively affirm that so far as this egg is concerned, our knowledge of its vitality depends directly and absolutely upon the fact that *heat* will cause it to exhibit the vegetative forces ; and just here, I would remind you that the organic germ in the egg, supplied with food available and stimulated by heat, consumes the food, develops a complex organization ; constructs systems, organs, tissues ; constructs a nervous, a muscular ; a circulatory, a respiratory ; a digestive system ; and brings forth the organic germ, as a complex machine, an animal prepared with all of its systems of animal life in full running order ; but notice, it thus develops only when supplied with Heat.

But is this correlation between heat and vitality confined to the embryonic stage of existence ? By no means ; and here I will give you only two instances, but in a future lecture I will discuss more fully this question of heat and adult life ; "if, (says Carpenter,) the Triton (common water newt,) be kept at a temperature between 58° and 75°, it has the power of *reproducing a limb* which has been cut off, but if the temperature be lowered, it loses this reproductive power. And in like manner a snail can regenerate *its head*, if it be kept in a warm atmosphere, but not at a low tem-

perature." In fact so very necessary is heat in adult life, that animals are provided with a special function, the *Calorific* or *Heat producing*, by which they preserve an almost uniform temperature; and should this temperature be lowered to any great extent serious results ensue. Therefore, not only is heat necessary to the growth and development of the organic germ, but also to the maintenance of its integrity; and from the vegetable and animal world we gather the evidence of its potent influence, especially in the constructive or histogenetic processes; and as we carefully analyze the phenomena of its action and the conditions of vitality, we become more impressed with the truth of the statement that "*Heat by an organic germ is correlated into vitality.*" Now, therefore if heat when passed into an organic germ, reappears as "vegetative force," and if this force continues active for any length of time, and if as stated this force is eminently constructive, the ultimate result of its action must be to *store up force*. When a given amount of *Heat* and its correlative *Light*, have been consumed, and correlated into this constructive force, and when this force ceases to act, have we lost this heat and light? Can we by any known process, recover and make perceptible this stored up force?

The answer comes to us to-day in a very practical form; what is that black substance within that stove? You will answer correctly, "it is coal." But physiologically what is coal? A vegetative production—a result of vegetation; a product of vegetative force; possibly thousands of years ago, Heat and Light were consumed in the growth of the magnificent Flora, which in successive centuries accumulating, upon the earth's surface, finally became buried by volcanic or other convulsive changes of that surface and thus have escaped ultimate chemical action, or complete destruction as we say. Now this coal, this black substance, consumed a given amount of Heat and Light in its growth, and we to day have placed it under conditions such as to compel it to return to us, that same amount of Heat and Light. So you

perceive that the physical force passed through an organic germ is not lost, but in the vegetable world may actually be regained in its same form and exact equivalent.

As before stated "force" is continuous and indestructible and in the inorganic world we can only change its form, its manifestations ; and this analysis of the phenomena of vegetative life proves the fact that this truth belongs also to the organic world, at least to that lower world which we call the vegetable.

But just here I will make some statements already foreshadowed if not distinctly asserted, viz : that in the two worlds, the vegetative processes are the same, the expressions of vegetative force are the same, the histogenesis if not absolutely identical is but little different ; they both have assimilative, reproductive, developmental expressions of *force*, and so far as mere vitality is concerned no other manifestation. By these forces the *human* machinery is built, the systems of animal life are evolved, and as the human animal is at birth imperfect, and in reality undeveloped, the same forces operating in embryonic life, are continued into infancy and finally to adult life, when all the machinery of animal life is supposed to be at its acme of perfection, and even then they are retained for repair.

From what has been said, you would infer that the laws and conditions of construction in the plant and animal are the same ; this is not absolutely true ; for an animal possesses *vitality* plus *animality* ; and this animality introduces an entirely new element into the equation ; if you will take the simple act of constructive histogenesis, however, the relation is of the closest kind, there being no very essential difference between the germination of a grain of wheat and the histogenetic changes in the incubating egg ; both are essentially constructive, but as soon as the fact of animality presents itself, and any animal power is evoked, the difference becomes marked, and the element of destruction enters.

*Vitality* is *constructive*, *Animality* is *destructive*. No physical machinery runs without waste and wear, no

animal machinery runs without waste and wear, and this element of incessant waste and incessant repair incident upon that waste, brings in the elements of difference and wide separation. The plant is simply constuctive,—a simple aggregation of atoms;—no waste, because the whole functional activity of the different parts of the organism tend to increase; the plant is the type of histogenesis. The animal requires the histogenesis. (1) To construct its systems (2) Repair the waste of these systems, the plant simply grows by histogenesis. In other words the “vegetative forces” in the animal world, (1) Construct—(2) Repair; and therefore animality depends directly upon vitality, but they are by no means identical; the animal forces are (1) muscular, (2) nerve, (3) brain force, and the integrity of these forces depends upon the integrity of those systems, or machinery which we term—muscular, nerve, and ganglia, and cerebral or brain ganglia, but the integrity of these systems is directly as the “vegetative” or “nutritive” forces of these systems, hence directly dependent upon the constructive vegetative force; for by this force they are *primarily developed*, and by this their *anatomical exactness* is *preserved*; by this force the wear and waste is repaired, and the *systems are kept in running order*.

That you may the better understand this I will repeat; “*Animality*, as we shall study it in the human being, or even in warm blooded animals where the processes are active, is the direct result of certain systems; the product of the working of the systems; the tissues, organs and systems which give *animality*, constitute a complicated machinery, but the forces by which this machinery is first constructed and afterwards kept in running order, are the vegetative, and thus *animality* while entirely distinct from *vitality* is directly dependant upon it as is stated above.” Vitality has reference therefore to histogenesis, animality has reference to the phenomena of *system working*; the tissues &c., which exhibit *animality* have no claim or right to *vitality*, and we shall find in our studies, that the anatomical elements are

distinct. That element, anatomically speaking, which constructs the machinery never works as part of this machinery; in fact it is entirely different, from the working element, and is called by several names; Beale calls it *germinal matter*—Chambers calls it "*nuclear matter*," Huxley calls it *protoplasm*.

This element is found in all tissues, and necessarily so, as it is the constructive element of these tissues; it is found in muscle, but it is a very different thing from muscular fiber; the fiber is the *animal working element* of the muscle; the fibre under proper conditions will give you muscular force, but it cannot repair itself, whereas the germinal matter cannot give the faintest evidence of muscular force, but it can and does repair and replace the waste which the fiber has sustained in acting.

You will recall the fact, that vitality is the common heritage of both animal and vegetable kingdoms, and its expression in each is by the three vegetative forces; remember the additional fact, that it is the *germinal matter* which exhibits these powers and that therefore *germinal matter* is the great constructive basis element of organic life. In our next lecture we will discuss Germinal Matter.

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## ARTICLE II.

### *Nitrous Oxide.*

Review of Article in New York Medical Journal, August 1870, on Nitrous Oxide as an Anæsthetic, by R. Armory M. D. of Massachusetts.

By JAMES B. HODGKIN, D. D. S. Alexandria, Va.

This agent has become so every day an affair in the hands of the dental surgeon, and so exclusively appropriated by the fraternity as an anæsthetic, as to seem almost to belong to us who are coarsely said to "find provision for our teeth, by pulling other people's out;" and any investigation into its physiological action by the medical profession is apt to be slighted by us who are prone to think that the daily administration of "gas" without question and without accident to all who apply for it, is sufficient evidence of its



innocuousness, and is sufficient knowledge for practical use. And indeed it may seem that such knowledge is sufficient when it is considered how little value those who take gas at the hands of any one who will give it, seem to set upon their own lives by placing them in the hands of reckless and ignorant parties. To this class of practitioners is perhaps due the credit of bringing nitrous oxide prominently before the public through its indiscriminate use, though the same public is of course dependent on some one else for a candid and impartial statement of its merits, and for a philosophic investigation into the rationale of its operation as an anæsthetic.

The New York Medical Journal for August 1870, contains an article from the pen of R. Amory M. D. of Mass., in which full details are given of a systematic and philosophic investigation of anæsthesia by nitrous oxide, and the conclusions of the author as to the cause of anæsthesia by that agent, with his reasons therefor. The experiments of Dr. A. bear the appearance of close observation, and his conclusions, if not sound, are logically so from his standpoint.

He states that he "commenced his experiments with the feeling that he was concerned with a dangerous anæsthetic, which was too commonly used by dentists and quacks," but arrives at quite a different opinion at the end. It is impossible within the brief limits proposed for this paper to give anything more than a condensed statement of the main points brought out by the investigations of Dr. Amory, which were first directed towards ascertaining the amount of carbonic acid retained in and eliminated from the blood during natural respiration, and during the different stages of anæsthesia. Accuracy in these experiments are confessedly difficult, and the author does not profess to give more than a proximate result.

Observation of the phenomena induced by the inhalation of nitrous oxide having led him to the belief that they were mainly due to an accumulation of carbonic acid in the blood, a series of experiments were instituted to ascertain the amount of this last gas accumulated and eliminated during

anæsthesia by nitrous oxide. A number of experiments made on a dog showed that the amount of carbonic acid eliminated from the blood during the unconscious state was reduced one half, leading to the supposition that the effects of the gas might be due as above stated to the accumulation of carbonic acid in the blood, or perhaps that oxygenation of the blood is prevented and carbonic acid, the result of oxygenation, withheld; which latter he deemed the more plausible theory from the fact that immediately after recovery from the effects of the gas the amount of carbonic acid eliminated was still small, it being necessary, he thinks, that the nitrous oxide taken into the blood be thrown off, before the carbonic acid can be produced in its normal quantity.

This accumulation of carbonic acid in the blood, is, he thinks may be an effect of the anæsthesia, not the cause.

In a number of experiments made on pigeons, one of these birds lived for forty minutes in a small receiver containing nitrous oxide, and then perished accidentally, while one confined in a smaller jar containing air, lived one hour and twenty-four minutes. This bird was in a comatose state in twenty-two minutes. Another pigeon lived thirty-two and a rabbit fifty-three minutes in a jar containing nitrous oxide.

"Two or three times," says Dr. Armory, "it has happened to me, when I had thought an animal dead from asphyxia, after the [prolonged] inhalation of nitrous oxide, to be surprised by voluntary respiration recurring after I had removed the muzzle. In fact I have now two dogs alive who had not respired for one whole minute when undergoing an experiment. Never has an animal died unexpectedly, and it was always very difficult to cause asphyxia if the smallest modicum of air passed into the lungs."

The experimenter thinks that death in all these cases was caused by asphyxia and not by paralysis of the hearts' action, nor probably from venous congestion; "nor was it probable that so inert a substance in the blood could cause paralysis of the nerves, as the contact of ether or chloroform may do."

By experiments performed on isolated nerves it was ascertained that their conductive power [outwards] was not diminished during the anæsthetic condition.

Some interesting details are given of experiments on the cerebral circulation, which the author thinks establish the truth of his hypothesis that capillary stasis occurs in the brain; and also a number of diagrams of sphygmographic traces of the radial artery, taken before, during and after the inhalation of gas. These diagrams show that during the anæsthetic state the pulse is hurried though diminished in power. The experimenter thinks that "these experiments prove that the gas, though respirable, (that is, capable of passing in and out of the lungs,) yet would not deliver up its oxygen to the blood, nor cause the elimination of as much carbonic acid from the blood as if atmospheric air were respired. He considers "this affect upon the capillary system to be caused by the non aëration of venous blood in the lungs;" and thinks that in asphyxia, (as he is pleased to call the extreme condition of anæsthesia produced by N. O.) caused by the gas in question, "the process of respiration ceases *after* inspiration and *before* expiration," and that the first impulse of returning respiration is to *expire* the gas from the lungs. He says:

"All animals, when they appear to respire [while under the influence of N. O.] can be awakened to consciousness almost immediately. But at a certain stage they appear to stop all attempts at respiring, and lie motionless. If not forced to inhale air they will die. The gas will not then support life."

But a seeming contradiction to this is given on a subsequent page, when he says:

"I have observed that the cardiac pulsations persist for a long time after the cessation of the respiratory function, and that a rabbit supposed to be dead fifteen minutes before, was picked up and thrown upon the table before proceeding to an autopsy, and immediately began to respire and lived several days, until the exigencies of a subsequent experiment demanded the sacrifice of its life."

Arriving at the conclusion from his experiments that "capillary stasis" is the cause of anæsthesia by nitrous oxide, Dr. Armory says he does not think death from it due to syncope, though he quotes Prof. Brown-Sequard as authority that this cause may produce death. He says :

"The capillary stasis is only transient and seems to depend on defective respiration. "\*\*\*\*The anæsthesia is caused by insufficient oxydation of the tissues by means of the blood. If the lungs be forced to receive this gas, they respire it without decomposing the oxygen, and death results from asphyxia ; or if air be allowed, the animal revives. \*\* Generally there is a period of three or four minutes after inspiring air that loss of sensation persists. If the gas be re-applied before the expiration of this period the loss of sensation may be kept up for a longer time."

The blood, owing to an insufficient supply of respirable oxygen, accumulates the pre-existing amount of carbonic acid in the blood, and in this way causes an arrest of capillary circulation."

Prof. Geo. Johnson is quoted as stating that there is no reason to suppose the inhalation of either nitrous oxide or nitrogen causes an accumulation of carbonic acid in the blood. Dr. Armory states that while "during anæsthesia from nitrous oxide the amount of carbonic acid eliminated was two thirds of that during consciousness, immediately after the inhalation and after recovery from the anæsthetic condition, the carbonic acid thrown off was only *one third the amount exhaled during anæsthesia*;" and he thinks that during that state "the free carbonic acid in the lungs is given off and until the stagnation in the capillary circulation is attained there is only a modification of combustion. When this capillary stasis occurs, there is no combustion, and temporary death to the nerve substance is effected. On the inspiration of air the combustion is renewed, and the product of oxygenation or combustion, viz: carbonic acid, does not *immediately* appear in the expired air. The nitrous oxide must be eliminated first. \*\*\*. There is no poison-

ous substance in the blood. There is simply arrest of capillary circulation."

*To be Continued.*

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### ARTICLE III.

#### *Separating Teeth.*

By Dr. J. N. CROUSE.

Read before the Illinois State Dental Society.

The answer to this question, "When should teeth be separated?" divides itself naturally into three divisions, viz : to prevent decay ; to make a correct diagnosis ; and to get room when they have decayed to fill them.

Until recently the dental profession was so strongly prejudiced against the practice of filing or cutting the teeth apart, on the ground that removing the enamel caused the teeth to decay ; that through their instrumentality and the seeming reasonableness of this theory, a very strong prejudice exists in the minds of the people and some of the profession, against filing the teeth. Yet observation has taught us the incorrectness of the opinion that filing teeth causes them to decay, and on the other hand, we are fully persuaded that in many cases much good results from separating the teeth, thereby preventing them from decaying. Now I have no idea of advancing the doctrine that teeth of children, or quite young patients, should be separated by filing them apart when decay has not commenced, or if superficial decay is found in the approximal surface, unless it is quite superficial, and can be removed without making much of a separation. I should prefer to fill rather than remove by filing them apart. Although much expense and trouble might be saved by separating the front teeth, freely, when decayed, of even young persons, leaving the space between them wider at the cutting edge than at their necks, and thus removing superficial decay, yet at this period of life, when the teeth are most subject to decay, and when beauty is most valued, especially by the female sex, the advantage of

such treatment is often more than counterbalanced by the mental suffering which the patient would experience by destroying the beauty and symmetry of these organs. Hence duty demands that we should not destroy their beauty at an age, when it is most valued, but repair the loss, when decay takes place, by filling; thus remedying the evil when it comes, rather than prevent it from coming. But in adults, when the teeth come together at the line of the grinding and cutting surfaces, leaving a space at the neck, making a repository for food, which is exceedingly difficult to remove, I should, in a majority of cases, separate them with a file, employing chisels when they can be applied to advantage; not merely cutting them apart so that the space at the edge and necks is equal, but restoring the convexity of the surface, being careful to polish out all the scratches, and leave the surface as smooth, if possible, as well formed enamel.

I do not advocate the separating of the teeth indiscriminately where they are together at the edges and space toward the gums. If teeth, in such a condition, can be readily cleansed of the food which lodges in this space, and the patient will exert sufficient care in keeping them thoroughly cleansed, and if decay has not commenced, I should not interfere. But we often see teeth in such a shape and position that it is next to impossible for the patient to remove the deposits from about them.

This is often the case when the gums and alveolar processes have receded and left the necks exposed. By making a careful examination we will find decay to a greater or less extent in a large majority of cases where we have the conditions referred to, especially if they are of long standing. Hence, in all such cases, I should recommend separating them freely in the manner already alluded to. Especially when we have this condition of the gums and alveola, the necks of the teeth being exposed to the action of corrosive agents, would make thorough work of separating; for when these teeth decay, it is usually upon the necks, and of such a nature

that it is very unsatisfactory filling them, as the decay extends over so much surface and crops out here and there, so that there are no well defined margins. Consequently, I prefer prevention rather than cure.

*Second.* Teeth should be separated for the purpose of making a correct diagnosis. That is, when we have the care of teeth which are crowded together so that we cannot ascertain *beyond a doubt* whether decay has or has not taken place, we should invariably separate them sufficiently to make a correct diagnosis. This is best done with pressure, either by driving a wedge with sufficient force to move them enough to ascertain their condition, or by separating them by a gradual pressure, which can be done by packing cotton, or cotton and sandarach, between them; or if they are much crowded, by drawing a thread or floss silk between them until sufficient space is obtained to insert a pine wedge. In this way we can separate several teeth at the same time if it is desired. We should continue this until sufficient room is obtained to determine whether or not decay has commenced on the approximal surfaces.

*Thirdly.* Separating to obtain space when we wish to fill the approximal cavities in cases where we have not ample space without it. How is it best done? This is a question in regard to which much difference of opinion exists, some advocating separation with file and chisel; some by rapid wedging in all cases, while others prefer to move them apart by gradual pressure, employing cotton and sandarach varnish, rubber or pine wood, each claiming his method to be the best one. I shall not denounce either of these modes, but will make an effort to show where each can be used to advantage. In the back teeth, where filing them apart will not mar their beauty, and where less space is required from the fact that in the great majority of cases, where these teeth are decayed on the approximal surfaces, thoroughness requires that we cut from the grinding surface to the cavity in the approximal surface, thereby securing space, unless this approximal cavity is very small, in which case, it would be

proper first to use a gradual pressure till space enough can be had, with what filing we wish to do, to perfect the operation.

The incisors and cuspids should generally be separated by pressure. And at this point I wish to enter my protest against the practice of separating indiscriminately by rapid wedging. Now and then, we meet with cases where this method possesses some advantages. Where the teeth have lost part of their sockets and are loose, where time cannot be afforded to separate by gradual pressure, and the patient is of such a temperament, or the parts surrounding the teeth are of such a character, that to force them apart with a wedge causes but little pain, we may pursue this method, if a proper amount of care is observed in the operation.

Yet, in a large majority of cases, to drive the teeth apart with a wooden wedge and mallet, is, in my opinion, a barbarous practice, causing unnecessary pain, sometimes exfoliation of the alveolar process, and often endangering the life of the pulp. Hence, in most cases I think that the preferable way is to separate by gradual pressure. For this purpose, sandarach varnish and cotton is very good, especially between the molars where it is difficult to insert a pine wedge. As to rubber, I do not consider it a proper material for this purpose, as the elasticity is so great, that as long as it has any amount of bearing it exerts sufficient force to move the teeth, and especially is this an objection when the teeth are sore, which causes them to move more easily than if not, and increases the soreness in a corresponding degree.

In most cases, therefore, I should separate by the use of pine wedges, pressing them between the teeth with sufficient force to gradually move them apart so as to accomplish the purpose without producing any great degree of sensitiveness; and should the teeth be found too sensitive to pressure after the space has been secured, I should leave them for a short time until the inflammation has subsided, retaining the space already gained.



## ARTICLE IV.

## Virginia State Dental Association.

RICHMOND, Nov. 18th, 1870

PROF. F. J. S. GORGAS,

*Editor American Journal of Dental Science.*

DEAR SIR:—In obedience to the notice you kindly gave in the October No. of your most excellent Journal, quite a goodly number of the dentists of our State met in Richmond on Thursday November 3d, 1870, for the purpose of organizing a State Dental Association. The spacious rooms of Dr. Judson B. Wood had been kindly offered for the place of meeting. At the hour appointed the meeting was called to order by Dr. Hugh M. Grant, of Abingdon, who nominated Dr. Jas. F. Thompson of Fredericksburg, as Chairman and requested the writer to act as Secretary. Dr. Thompson in a very neat speech thanked those present for the honor conferred upon him, and explained the object of the meeting to be the organization of an Association having in view the cultivation of the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists and to promote amongst them mutual improvement, social intercourse and good will.

On motion the chairman appointed a committee of five consisting of Drs. H. M. Grant, J. B. Wood, T. M. Henley, J. W. Scribner and G. B. Steel to prepare business for the meeting.

During the absence of the committee, the chairman read letters from several of the most eminent members of the profession in the State, regretting that business and other previous engagements prevented their attendance, but assuring that their influence should ever be exerted for the furtherance of the contemplated object, and urging that all should use their best endeavors to push forward so noble a cause.

The committee on returning reported a Constitution and By-Laws for the government of the Association, which in all honor to them I must say compares favorably with those

which govern any Dental Association throughout the country. The Association was then organized under the name and title of the Virginia State Dental Association, and adopted the Constitution and By-Laws offered by the committee and at once proceeded to the election of officers, which resulted in the election of:

DR. JAS. F. THOMPSON of Fredericksburg, as President; DR. HUGH M. GRANT of Abingdon, 1st Vice President; DR. WM. M. DORSET, of Ballsville, 2d Vice President; DR. T. M. HENLEY of King and Queen Co., 3d Vice President; DR. GEO. F. KEESEE of Richmond, Secretary, DR. JUDSON B. WOOD of Richmond, Treasurer; DRS. HUGH M. GRANT, JAS. A. CHAPMAN, and F. A. JETER, as Executive Committee.

After the completion of all business, at a late hour the the Association adjourned to meet in Richmond on the first Thursday in November, of the next year, (1871,) the members returning to their homes enthused and feeling in their heart of hearts that a brighter era was beginning to dawn upon the dental profession in our State, and that the time was speedily coming when the days of "quack's" shall have been numbered. We earnestly hope at our next meeting to find a much larger number of the dentists of the State assembled; the old veterans coming to give their experience to the younger practitioners, and the latter coming with ambition and zeal to push forward the good work which has been commenced in our midst.

Very Truly Yours,

GEO. F. KEESEE, D. D. S., Secretary.

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#### ARTICLE V.

#### *American Academy of Dental Science.*

The Third Annual Meeting of the American Academy of Dental Science was held in Mercantile Hall, Boston, September 26th 1870, at 12 o'clock, M.

The President, Dr. Daniel Harwood, on taking the chair, congratulated the members upon the present prosperous con-

dition of the Academy, and upon the encouraging prospects for the future.

There was a good attendance of members present, including a number from other States, among whom were Dr. J. H. Foster of New York, Dr. F. N. Seabury, of Providence, R. I., Dr. Elbridge Bacon, of Portland, Maine, Dr. C. K. Fiske of St. John, N. Brunswick, and Dr. Edward Gage, of Paris.

The following officers were elected for the ensuing year:

*President*, Daniel Harwood, M. D.

*Vice President*, E. T. Wilson, M. D.

*Cor'g and Rec'g Secretary*, E. N. Harris, D. D. S.

*Treasurer*, E. G. Tucker, M. D.

*Librarian*, John Clough, M. D.

*Board of Censors*, Drs. E. G. Tucker, J. L. Williams, and W. W. Codman.

At this and the previous monthly meeting, the following new members were admitted:

Drs. T. B. Hitchcock, L. D. Shepard, and T. H. Chandler, Professors in the Harvard Dental College, Boston, were elected active fellows; also Drs. J. T. Codman, of Boston, J. H. Batchelder, of Salem, and S. P. Martin, of Worcester.

Dr. F. N. Seabury, T. D. Thompson, M. B. Mead, of Providence R. I., James McManus, of Hartford, Conn., and H. M. Bowker, of Montreal, Canada, were elected Associate Fellows.

Dr. Amos Westcott, of Syracuse N. Y. was elected an Honorary Fellow.

The Annual Address was delivered by Joseph H. Foster, M. D., of New York, on the subject of "Professional Responsibilities." Dr. Foster occupied one hour and twenty minutes in the delivery of his address, which was a very able production, and eloquently delivered, and received the hearty applause of the assembly.

The thanks of the Academy were presented to Dr. Foster, and a copy of his address requested for publication and for preservation in the Archives of the Society.

Interesting papers were read by Dr. Joseph E. Fisk of Salem, on "The Manufacture of Mineral Teeth"—By H. F. Bishop, D. D. S., of Worcester, on "Dental Societies"—and By John Clough, M. D., of Woburn, on "Causes of Diseased Teeth and Gums, and Preventive Measures for their Preservation."

At half past 5 P. M. the Academy adjourned to the Parker House to partake of the third Anniversary Dinner, which was a very elegant affair, served in Parker's usual excellent style, and the festivities were continued until a late hour.

EDWARD N. HARRIS, D. D. S.  
Cor. and Rec. Sec.

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## SELECTED ARTICLES.

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### ARTICLE VI.

#### *Gold Plates with Rubber Attachments*

By W. H. EAMES, D. D. S.

Among the many different styles of artificial work at the present day, there is none, perhaps, which for beauty, strength and cleanliness, excels what is known to the profession as combination work: a gold base with teeth attached by means of rubber. This style of work, when neatly executed, and so constructed as to hide perfectly the means of attaching the teeth, will rank among the finest specimens of dental art. We will endeavor to describe three methods of constructing this style of work, suggested by different operators.

CASE.—A full upper denture. The plate is struck up and fitted in the usual manner. The teeth (in blocks or sections adapted for rubber work) are ground to the plate and articulated as for the ordinary rubber attachment. In the final arrangement or articulation of the teeth in the mouth, before finishing, they should be attached to the plate with a strong adhesive wax, or with gutta-percha, to avoid displacement in the subsequent steps of the process. Remove the plate from the mouth, oil the outside of the teeth

and edge of the plate, in two sections, meeting at the median line in front. When these impressions or molds are sufficiently hard, they should be removed from the teeth and trimmed to about the one-half of an inch in thickness, so that the moisture can be easily driven off. As these moulds are friable when dry, it is well to place a strip or two of small wire one inch and a half in length, in the body of the mould before the material sets, to prevent their breaking. When the moulds are thoroughly dry, form a shallow cup around them with putty or sand for the reception of the metal and cast in the zinc; to form a die, get up the counter die with lead in the usual manner. In the dies thus prepared, strike up the rim for the outside edge. The gold used for this purpose should be fine, and not less than No. 30 Stubb's gauge.

If there is to be no opportunity to test the accuracy of the articulation by trial in the mouth, before the work is completed, a small plaster articulator should be made before the teeth are disturbed, showing their exact position on the plate. Having secured this, remove the teeth from the plate by warming it slightly, and solder on the rim. This is best done by placing one section in position, retaining it there by means of small wire clasps, placing one at each end and one in the centre; commence soldering at the heel or back end; having secured this point, pass on to the centre and secure a point there, and finally at the front. Now place the teeth, which are still attached to the wax, in position and see if they fit nicely down the plate within the rim, if not, the position of the rim may be changed slightly to admit the teeth, and then the soldering completed; secure the opposite side in the same manner, uniting the ends in front. A very good means of securing a nice adaptation of the parts is obtained by placing the moulds in which the die for the rim is cast, in position on the plate, after removing the teeth and casting a little tinner's solder or even lead or tin, in the space formed by the gums of the teeth, thus forming a matrix which may be forced down inside the rim after the solder

ing is complete, bringing the rim out for the reception of the teeth. If this plan be adopted, one should be careful to cover the surface of the plate with carbon or some substance to prevent the metal adhering to it. Having completed the outside rim, place the teeth in position on the plate, and by means of the articulator or the patient's mouth, see that their position is correct. Secure them firmly to the plate with a stiff wax (composed of equal parts resin and beeswax); with a wax knife, trim out the wax to the lingual border of the teeth, leaving only enough to cover the heads of the pins, scarcely that; trim as near to a perpendicular with the surface of the plate as convenient, flowing the surface on evenly; oil and take a plaster impression of the lingual surface of the plate and teeth, or the wax inside the teeth; from the plaster model thus formed, get up a set of dies and strike up the rim for the inside. This rim should also be of fine gold, and be in two sections or a single piece; in thickness about No. 26 or 28, dependent on the case. The posterior ends of the outer and inner rims should be so formed as to be united around the end of the posterior block. When this inside rim is fitted nicely all along the border of wax, while the other border fits up nicely against the lingual surface or margin of the teeth. When the rim is thus fitted, place it in position and mark the position of the rivets, in the blocks, on the rim; remove the rim, and between the points indicated for the rivets, punch two holes with a plate punch, one above the other; prepare some small staples of gold wire; pass the ends through holes, leaving the loops to project about the length of the pins in the blocks; solder them in on the lingual surface, and dress off the ends. These loops form the means of attaching the rubber. Place the rim in position of the plate, and retain it there by melting some shellac around the edge; carefully remove the teeth; prepare several wire clamps, of such shape, that while the open end clasps tightly the free margin of the rim, the opposite end is brought up to a line with the edge of the plate. Having placed these clamps in position around the rim, pre-



pare an investment of equal parts plaster and sand, and invest the palatine surface of the plate, embracing the close end of these clamps. When the investment is hard, the shellac may be removed from the lingual surface of the rim and plate, the clamps retaining the rim in contact with the plate. Care should be taken that no plaster reach the plate or rim, where the soldering is to be done. Heat up evenly and flow the solder. The plates should be clean, and the borax put only where it is necessary to flow the solder. When the soldering is completed, pickle the plate and place the teeth in position; and if the rim should not fit the teeth nicely, burnish it down against them at all points, leaving no space for the rubber to show itself; prepare some rubber in small strips; set the plate with the teeth on in the oven or in some place where it will get quite hot; remove all the blocks; place a few strips of rubber underneath the posterior block, on one side; place the block in position, forcing the excess of rubber forward underneath the second block; place more rubber under this second block, and press it down in the same manner. Proceed in this way till all are in position; if any rubber shows on pressing the last block to place, remove it (the block) and cut off the surplus rubber when all are in position and no rubber in sight, imbed the case in plaster in a vulcanizing flask, and vulcanize. Finish the same as any ordinary gold plate.

Another mode of accomplishing the same end has been adopted by Dr. Hewitt, of this city. After preparing the plate for the reception of the teeth in the manner above described, he drills four or five holes through the plate, about one eighth of an inch in diameter, along the ridge underneath the base of the teeth; to these holes he fits very accurate little plugs of gold of the same material as the plate; then packs the rubber into these holes, forcing it into them till it appears at the next, and so on till the case is packed; he then drives these plugs into the holes in the plate; the rubber closing around them, and into the notches previously made in the plugs, holds them fast, after the case is vul-

nized. In finishing the plate, the protruding ends of these plugs are dressed off, and if neatly done, they cannot be seen.

Another plan of which we have heard, is the same except that the rubber is packed through the holes, in the posterior end of the rim, and then these holes are closed in the same or similar way to that of Dr. Hewitt's. By having the teeth carved to suit special cases, a beautiful artistic effect can be produced both in and out of the mouth by this style of work.

When ordinary rubber block teeth are used, the case may have a stiff, artificial look; the shape and arrangement of the teeth may not be all that could be desired; still it is superior in many respects to any other style of gold work.  
—*Missouri Dental Journal*.

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## ARTICLE VII.

### *Light vs. Heavy Gold Foil and Crystal Gold.*

By FRANK ABBOTT, D. D. S.

Read before the American Dental Association.

In nearly every journal devoted to the interest of the Dental profession, in nearly every Dental society, and in the private conversations of Dentists with each other, the subject of the different preparations of gold for filling teeth is referred to, and the supposed merits of each canvassed, in some instances to an enthusiastic extent. This has been more particularly the case recently or since the introduction of "heavy foils."

There was a time, probably in the recollection of some of our oldest practitioners, when it was impossible to obtain any but heavy gold; in fact, I have heard Dr. Eleazer Parmly state that during the first years of his practice he manufactured or prepared his own gold for filling teeth, which was done entirely with the rolling mill. At that time that was the best preparation of gold known to dentists. It has since been the constant desire of many dentists to obtain lighter



foil. Some have even gone so far as to require it as light as  $1\frac{1}{2}$  grs. to the sheet. Recently, however, the views and practice of many have changed, and now they require gold of the same sized sheets, weighing from 10 to 480 grains. If you ask those gentlemen what advantages they derive from the use of these preparations, they will tell you that they can "work more rapidly," "make more perfect fillings," that they "can pack more gold into a cavity of the same size than they can of light or soft foil," and in short that this is the material with which perfection in filling teeth has been arrived at.

Other gentlemen in equally as good standing in the profession will say that perfect plugs can not be made with such heavy materials, but claim that with crystal gold the greatest degree of perfection is obtained. They will tell you that they can pack one quarter more of this gold into a given sized cavity than they can of any other preparation. And if any doubts are expressed in regard to the truth of the statements of these gentlemen, you are immediately written down as an old fogy, a non-progressionist, or some other equally interesting appellation. Now there is a class of Dentists who doubt very much the truth of these assertions; a class, too, who are fond of advancement and do as much to advance the profession as any connected with it. This class is represented by those who believe their time and energies are best spent to better advantage in using materials and teaching young and inexperienced men in the profession how to use these materials, with which it is well known teeth can be saved than in advocating the use of that which many believe tends to destroy untold numbers of teeth which might with so much substance less difficult to adapt to the irregularities of cavities, have been saved. Imbibing to some extent the views of this latter class, and feeling that it was due as well to the profession as to the public, that a correct solution of the question of the best preparation of gold for filling teeth should be made, I have carefully conducted a series of experiments in the following manner and with the following results:

I first had several cavities prepared in steel of precisely the same size, to resemble nearly as possible cavities in teeth. In order to accomplish this more perfectly, several fine cuts were made in each with a graver, to represent the cuts of excavators, at the same time they are so arranged that the entire mass of each plug could be removed without marking its surface. This done, gold of the following numbers was then prepared (taking care that the pieces should all be as nearly the same weight as possible), viz: Nos. 2, 3, 4, 5, 6, 10, 20, 30, 40, 60, 120, 240, adhesive foil, and Nos. 3, 4, 5, and 6, soft foil, and Watts' crystal gold, No. 1.

An automatic mallet, with the same weight of stroke, and the same point, was used for each operation. The time occupied in condensing each was as follows:

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| No. 2, adhesive.....14 minutes.   | No. 40, adhesive..... 28 minutes. |
| " 3, " .....14 "                  | " 60. " .....31 "                 |
| " 4, " .....14 "                  | " 120. " .....35 "                |
| " 5, " .....16 "                  | " 240. " .....36 "                |
| " 6, " .....17 "                  | " 3, s'ft or non-adh. 11½ "       |
| " 10, " .....18 "                 | " 4, " ..... 12 "                 |
| " 20, " .....21 "                 | " 5, " ..... 14 "                 |
| " 30, " .....24 "                 | " 6. " ..... 16½ "                |
| " 1, Watt's crystal gold, 14 min. |                                   |

On removing the plugs, after their surfaces were finished, I found that Nos. 3, 4, 5, and 6, non-adhesive foil and the crystal gold plugs all presented the appearance of having been perfectly adapted to the cavities in every particular, while all the other cavities were more or less imperfect, even the very light Nos. 2, 3 and 4 presented innumerable minute openings into the body of the plug, and the fine cuts made by the graver were not perfectly filled, and as the gold increased in thickness, the imperfections increased correspondingly, so that from No. 10 to No 240 there was hardly an approximation to adaptibility. The cuts of the graver were not filled; every point where the gold was folded in the least an open space was left; in short they presented an appearance which might very appropriately be called the height of *imperfection*.

The weight of each plug was as follows:

|                      |             |                        |        |
|----------------------|-------------|------------------------|--------|
| No. 2, adhesive..... | 15½ grains. | No. 60. adhesive.....  | 13½ gr |
| " 3, " .....         | 16 "        | " 120. " .....         | 15 "   |
| " 4, " .....         | 15½ "       | " 240. " .....         | 15 "   |
| " 5, " .....         | 16 "        | " 3. non-adhesive...   | 17 "   |
| " 6, " .....         | 16 "        | " 4, " .....           | 17 "   |
| " 10, " .....        | 14½ "       | " 5, " .....           | 17½ "  |
| " 20, " .....        | 14 "        | " 6, " .....           | 17 "   |
| " 30, " .....        | 15 "        | " 1, crystal gold..... | 14½ "  |
| " 40, " .....        | 15 "        |                        |        |

With the above facts before us, what becomes of the assertions that with heavy gold "time is saved"; "that more perfect operations are made," and "that more in weight can be packed into a cavity than can be of soft or non-adhesive gold of light Nos.?" These questions I leave for the advocates of heavy and crystal gold to answer. In summing up this matter it seems unnecessary to add that the light Nos. of soft foil present decided advantages over any other material experimented with.

1st. It requires about one-third the time under the same circumstances to manipulate them.

2d. Cavities are apparently perfectly sealed with them while all the others except crystal gold, present more or less imperfections; and

3d. From fifteen to eighteen per cent. more gold in weight is with the same pressure packed into a cavity.

## ARTICLE VIII.

*On the Identity of the White Corpuscles of the Blood, of the Salivary Pus, and Mucous Corpuscles.*

By JOSEPH RICHARDSON, M. D.

The nature of the nucleated corpuscles so abundant in saliva has long been a subject of some uncertainty, although they have probably, as favorite tests for the higher powers, been more frequently examined by microscopists than any other constituent of the glandular secretions. Observers seem to have been generally content to accept them

ply as useful measures for the capacity of the higher objectives, and passed on without any attempts to solve the mystery of their origin; Kölliker, indeed, advanced the theory that they were essentially a form of exudation corpuscles, but hitherto, his hypothesis does not appear to have generally accepted by microscopists as a fixed fact.

The following experiments, undertaken to elucidate their constitution, were performed with the large Powell and Lealand's instrument, so long a denizen of the "Microscope Room," in the Pennsylvania Hospital, and no doubt endeared by constant association to many generations of "Residents," as well as to myself. When it was discarded by the Institution I became the purchaser, and after undergoing some repairs, and having adapted it to a 1.25th inch objective (made by Mr. William Wale of Fort Lee, N. J.,) it has accomplished the work below described.

The salivary corpuscles examined under a power of eleven hundred diameters present the appearance of perfect spheres, varying from the 1.1400th to the 1.2500th of an inch in diameter, each having a very transparent but beautifully defined cell-wall of exceeding tenuity, which encloses from one to four almost equally transparent nuclei of a circular or oval form, whose diameters range from 1.3000th to 1.4000th of an inch. These nuclei are situated sometimes centrally, but more commonly near one side of the corpuscle, and the cavity between the margin and the cell-wall is generally filled with from twenty-five to fifty molecules, not more than 1.20000th of an inch in diameter, whose characteristic is that of rapid and constant motion. Some of these molecules seem to be elongated into an oval or hour-glass form, but the activity of their movements renders it difficult to ascertain this with precision. In my observations these corpuscles have appeared to enlarge and become flattened, from the pressure of the glass cover, as the stratum of liquid beneath became thinner from marginal desiccation, so that usually in the course of an hour or so they burst, and discharge about one fourth of their contents, when two, three

or more of the molecules swim away, continuing their revolving movements until they pass out of view; the other granules outside and those remaining within the cell become within a very few seconds entirely stationary. If a solution of aniline red, of the strength of one grain to the ounce of distilled water, be allowed to penetrate at the margin of the cover, the nuclei of the salivary corpuscles are restained of a bright crimson, and are thus exhibited with beautiful distinctness; the dye appears, however, to exert no immediate influence upon the movement of the molecules, as I have rarely been able to find cells in which they continued to move after the nuclei became at all colored.

In examining some urine, obtained on the 8th of August, 1869, near my late residence, in Western New York, from a patient who complained of severe pain in the kidneys and bladder, I was surprised to find that a deposit, which appeared to the naked eye purulent, was chiefly composed of cells, exactly resembling in form, size, definite cell-contents, contained nuclei, and actively revolving molecules, the same as the salivary corpuscles with which I had become so familiar; I should have imagined that these preceeded from an accidental adulteration with sputum, had I not been fortunate enough to have ocular demonstration to the contrary by procuring the specimen. I examined the corpuscles repeatedly in the course of the two following days, during which the movements of the molecules continued, but could not see anything else of them except drawings which I carefully preserved.

On consulting the text-books to which I had access, I found that neither Beale, Roberts, Bird, nor Naubauer & Voss, in their works on the urine, mentioned cells such as those above described, although the editors of the "Micrographic Dictionary," in their description of the salivary corpuscles, state that they have seen them by myriads in the renal secretion; nevertheless, numerous specimens examined during the following few months, seldom without special scrutiny, for similar bodies, afforded none, until in a deposit occur-

from urine brought me by a medical friend about December 1st, the corpuscles I had so long been in search of were at last recognized, and on this occasion I was able to exhibit them to several microscopists, among others to my friend, Dr. H. C. Wood, Jr., Professor of Botany, in the University of Pennsylvania.

On the 5th of December, I procured a sample of urine from a case of cystitis, which had only been passed a few hours, and on placing it under the field of the 1/25, I found many of the pus-globules exhibiting the amoeboid movements described by Dr. Beale, in his late elaborate work on the "Microscope in Practical Medicine," no corpuscles containing moving molecules were visible, but observing that some of the pus-cells having a spherical outline were almost opaque, and only about 1.3000 of an inch in diameter, it occurred to me they were perhaps only contracted by the exosmosis of their fluid contents into the surrounding denser medium, and the idea suggested itself to try the effects of diminishing the specific gravity of the urine, by the addition of water. Under this treatment, I found that the cells which had been exhibiting amoeboid movements, soon assumed a spherical shape, rapidly enlarged until they reached the diameter of about 1.1700 of an inch, when the contained molecules began to revolve, and ere long took upon themselves the extremely rapid and confused movement which I had twice before seen in cells occurring in urine, and hundreds of times in the salivary corpuscles; the action of aniline solution rendered beautifully distinct, definite nuclei similar to those found in the salivary bodies.

The opportunity of corroborating the interesting and remarkable researches of Dr. Cohnheim, of Berlin, on the identity of the pus, and white blood corpuscles thus obviously presenting itself, I proceeded with the following experiments. Drawing a drop of blood from the tip of my finger upon a "growing slide," I covered with thin glass, and placed it upon the stage of the microscope, after finding a white blood-corpuscle showing well marked granules,

I raised the objective, and arranged a fine filament of the from the reservoir filled with fresh water to the upper edge of the cover, and a fragment of wet paper to the lower edge according to the usual method for securing a constant current beneath the thin glass. On depressing the body of the instrument and bringing the corpuscles again into view I found it still adhering to the surface of the cover, notwithstanding the torrent of red globules hurrying over the field and these became paler and less distinct by reason of the diminished density of the serum. The white cell first gradually expanded and displayed its delicate wall with rounded nuclei, then, after acquiring the magnitude of about one 1700<sup>th</sup> of an inch, it exhibited the rapid and incessant movement of its contained molecules, and finally, when its diameter reached about one 1400<sup>th</sup> of an inch, it broke suddenly, discharging a portion of its contents, whose outbreak resembled that of swarm of bees from a hive, some particles of which, actively revolving as they were, swarmed off to the confines of the field. On repeating the observation and allowing some of the aniline solution to flow in with the water after the first few minutes, the nuclei were strongly stained and rendered beautifully distinct although the movement of the molecules promptly ceased in this respect as in all the others showing a precise identity with the reactions afforded by the pus and the salivary corpuscles as above described. It should be noted that a certain variable proportion of the white cells of the blood thus treated exhibited no moving molecules, and apparently consisted solely of a nucleus and cell-wall. It is worthy of remark that this experiment amply demonstrates the innumerable advantages of high objectives (which some even pretend to doubt), for the remarkable movement of the contained molecules seems to have escaped the attention of Prof. Virchow, the great author of "The Cellular Pathology," (vide p. 181, Chance's translation, 1863). Although the observation was first made with the aid of a one 2500<sup>th</sup> yet afterwards knowing exactly what to look for, I had li



difficulty in demonstrating to various gentlemen the revolving molecules thus brought into view with powers as low as the one 8th inch.

A portion of fetid pus from an abscess, and a specimen of mucus from the nasal fossa, under a like treatment gave similar results, which did not materially vary in numerous trials.

Tracing now the white blood-corpuscle from its condition of irregular outline, and amoeboid movement, as observed in serum and in heavy urine, when the circumambient fluid approaches the density of 1028, through its rounded form with slightly more distinct nuclei, in the liquor puris, and in urine of lower specific gravity, we find that immersed in a rarer liquid, approximating to the mean density of the saliva (1005,) it has an accurately spherical outline, is more than twice the magnitude, and contains a number of minute actively moving molecules, thus exactly resembling in all sensible characters the true salivary corpuscle; and it therefore seems reasonably certain that the blood, under the appointed nervous influence, congesting the buccal mucous membrane and associated glands, moves slowly enough through its capillaries to allow some of its white globules to penetrate the walls of the vessels, as they are said to do those of the frog's mesentery in Cohnheim's experiment (Virchow, archiv; Band 40, 8, 38, u. s. w.), which under the influence of the rarer saliva, expanding them and setting them free to move their contained molecules constitute the bodies so long known to histologists as the corpuscles of the salivary fluid.—[*Balt. Med. Jour.*

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## ARTICLE IX.

### *Periodontitis.*

By W. H. WAITE, D. D. S., Liverpool, England.

The disorder known by the above name consists in an inflamed condition of the investing membrane of the roots of teeth. It may occur on one root only, and in one spot,



very circumscribed, or be found extensively spread over nearly the whole surface of the roots. Accompanying this inflammatory state, there is frequently a thickening of the periodontal membrane, causing more or less protrusion of the tooth from the socket. The symptoms are tolerably defined and the diagnosis easy. If the opposing tooth is *in situ* pain is experienced in striking the jaws together; while at the same time there is present a desire to grind the teeth together for by so doing a kind of temporary relief is afforded. A gnawing, boring pain, considerably aggravated when the head is laid down, and warm at night—not quite so acute as true toothache (except in the worst stages) but quite distressing—having a marked effect on the mental energies—some degree of concomitant inflammation about the gum in the neighborhood, and soreness to the touch—these are the chief features arising in connection with this disease.

Sometimes a patient will be unable to locate the sensations with sufficient precision to indicate the offender, and in such cases, if the teeth are gently tapped, one at a time with the handle of an excavator, the defaulter will not fail to respond. The causes of this affection enumerated in some of our standard works are various, and, without doubt, periodontitis may proceed from numerous predisposing and exciting causes; still, probably, it would not be unsafe to say that fully 95 *per cent.* of these cases are attributable either to the presence of a dead pulp, or to the manipulations and treatment employed for the devitalization and extirpation of the pulp. The worst forms of periodontitis are to be found where, the cavity of decay having extended very near to the pulp cavity without actually exposing that organ, a large gold or amalgam filling has been inserted, and by reason of the conduction of thermal sensations through the plug, the pulp has sooner or later lost its vitality. Now such death of pulp is speedily followed by the liberation of a foul and irritating gas, which, being confined by the filling, works its way outward through the apex of the nerve canals, and coming into contact with the periosteum, ac-

as an irritant thereon, inducing determination, congestion, and at length inflammation. Further on the periosteum becomes detached from the root, suppuration commences, and we have as the issue *Alveolar Abscess*.

But seeing that these large fillings of metal alone are apt to produce such unpleasant consequences, we are led to consider the advisability of interposing some non-conductor between the metal and the base of the cavity. Thus, if a gold filling be intended, we may place a layer of oxy-chloride of zinc, or Hill's Stopping, over the floor; or if an amalgam filling is to be introduced the oxy-chloride answers our purpose, and in some such way it seems probable that many large cavities among the ill-fated first molars may not only be filled but filled with a fair prospect of permanent success. Beyond a doubt, caution and the studious adoption of every preventive measure, are not thrown away in any case of deep-seated caries, for whatever may be the merits of the treatments noted hereafter, it is certainly very annoying to have a patient return shortly after the insertion of a large filling, complaining that "this tooth is so tender, I can't bear to close my mouth."

Remedies as varied as the causes of periodontitis have been suggested from time to time, most of them valuable in some circumstances, and valueless in others. It would seem as though a special bond of sympathy were called into existence between the local affection and the general health of the patient. Cold, disorder of the stomach or bowels, indigestion, rheumatic or gouty tendencies, any and every derangement of the system, appears to act, and be reacted upon by this disease; and oftentimes, baffled by the complications, and besought by the patient, we are led to give it up and remove the offending tooth, rather than encounter the apparently endless annoyance.

Happily the extreme cases are not a large majority. If "dead pulp" can be clearly diagnosed, (and the history of the case, taken together with the opacity of the tooth's appearance, will generally afford decisive evidence) and if

the case presents early, say, within two or three days of the commencement of uneasy sensation, there is no quicker surer method of procuring relief than to remove the filling open freely into the pulp cavity, and afford a vent for the gas pent up therein, thoroughly cleansing the canals from every particle of dead tissue, and treating with dressing camphorated spirit, followed by dilute carbolic acid, &c. till all offensive odour has disappeared, and finally when the condition of health is fully established, filling the canals and refilling the outer cavity; or, if from any reason it is considered undesirable to remove the filling (and this may often be the case) an entrance can be made from the neck of the tooth, just at the margin of the gum, into the pulp cavity, by drilling right in through the bone, with a sharp spear-pointed drill. This is known technically as "odontotrypy." Drills may be easily made of broken excavators suitable for this purpose, and, if the tactile sense of the operator is sufficiently acute, he will observe that just as the instrument punctures the pulp-chamber, it will be inclined to stick, and by this he will know that the object is accomplished. Frequently, moreover, on enquiry it will be found that the patient has tasted the peculiarly unpleasant gas thus let out into his mouth. As a rule the symptoms rapidly subside after the gas has escaped. Complete restoration may be facilitated by placing a guard of gutta-percha on the teeth of the opposite side of the head, to prevent closure of the jaws upon the affected tooth, and so shield it from irritation of that sort; also, by carefully drying the gum and then painting the part with the official Tincture of Iodine, or the mixture given below. When periodontitis supervenes on devitalization and thorough extirpation, palliative treatment is indicated, such as free lancing of the gum, copious bleeding, after which cold applications, without astringents within the mouth, liberal use of Iodine, or the Iodine and Aconite, which last is certainly an excellent remedy. Again, it has been suggested that *Mercurius Vivus*, the third decimal trituration, given in small doses two or three times

day is a specific in such case. This is also a good medicine, but scarcely infallible. Indeed it is more than doubtful if anything is absolutely certain. The wise practitioner, however, is ever ready to employ any means which the peculiarities of the case, or the experience of his fellows, may suggest; and in this, as in all other affections, will not be bound by prejudice simply to follow a beaten track, but be ready on any occasion to exercise his ingenuity to discover the best treatment for each case as it presents, always bearing in mind the intimate relation that exists between this disorder and nearly every phase of systematic trouble.

Perhaps one of the greatest evils associated with this form of dental disease is the fact that patients do not generally recognize the true cause of their trouble. Neuralgia, or *tic*, as they call it in some places, seems to be a sort of universal scapegoat, on whose back are laid all kinds of dental difficulties, and to get rid of which the patients will swallow any amount of physic before they wake up to realize wherein the mischief truly consists, and then too often the disease has passed into the suppurative stage. The last hint as to the treatment of periodontitis, therefore, is never to fail in warning a patient of the possible result in every case, where there appears any reason to suppose that sooner or later the disorder may appear.—*Canada Journal of Dental Science*.

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#### ARTICLE X.

##### *On the Application of Carbolic Acid as a Local Anæsthetic in Surgical Operations.*

By J. H. BILL, M. D., Surgeon U. S. Army.

In conducting some investigations on the action, &c., of carbolic acid, the writer has made the following observations, which as they seem to be of practical importance, he communicates in advance of the other results:

All who have handled this substance must have noticed the tingling sensation (not unlike that produced by aconite)

in the finger tips and other parts touched by the acid, which presently passes into a greater or less anæsthesia. On trying to determine the amount of this anæsthesia with an ordinary æsthesiometer it was found not only impossible to distinguish two points, however widely separated, but even to recognize the presence of one.

The prick of the point was not felt at all as pain, nor was an incision productive of uneasiness. The experiment was therefore extended thus: The radial side of the writer's left forearm was covered with a cloth soaked in a saturated solution for half an hour, then a streak was traced over the course of the radial artery with a camel's hair brush dipped in acid liquified by one-twentieth bulk of water. The streak extended from the styloid process to near the elbow and after a few minutes was rubbed off. An incision was then made with a common scalpel from a point about two inches above the styloid process towards the internal condyle for five inches, occupying as near as possible the middle of the streak made with the brush, and extending down to the fasciæ investing the flexor muscles (superficial) of the thumb and fingers, so that at its lower extremity the radial artery was exposed and could have been ligated. The incision was unattended with pain, save where nerves distributed to or passing over the muscular fasciæ were pricked or divided, and even in this case the pain was not at all unbearable. *The incision of the integument was painless*, and the writer would have been unconscious of the injury save from the sensation communicated to his hand holding the knife as it was drawn through the tissues. This observation or experiment was made nearly a year ago. It was applied practically at once to all minor cutting operations. The writer has not incised a felon or bubo since without successfully employing this method for preventing or greatly mitigating pain. Many cases could be given, one will suffice. David Harris, of Vancouver, applied with his second finger of the left hand highly inflamed from a felon, the parts much injured by burrowing of pus. A previous felon had been

treated on another finger a few months before, and the requisite incision had given him exquisite pain; the patient therefore apprehended great suffering on the finger now diseased, and begged for chloroform. However, the finger was soaked for fifteen minutes in warm water containing three per cent. of carbolic acid, dried, and then a brush dipped in the concentrated acid, drawn over the finger in the course of the intended incisions. These, two in number, were then made, using a thin edged scalpel by a slow sawing motion, allowing only the weight of the knife to make the cut. The patient stated that he had suffered no pain, or not more than would have resulted from handling the parts. The parts healed at once. Sometimes it is necessary after making an incision nearly through the integument, if sensibility becomes apparent, to brush out the wound made with some liquefied acid before extending the incision deeper. This was necessary in a palmar abscess treated by this method without pain. The writer has excised a small tumor partly by this plan. Buboës have been operated on painlessly, and, in short, the writer can recommend the plan in any cutting operation where no dissection of the skin is involved, and where all the pain results from the cutting of the skin. It is hoped that it will be of special service to those who are compelled to operate without an assistant. The writer was thus compelled this summer to remove from his right hand, by an incision of over two inches in length, a large wooded splinter which had been thrust through the palmar fasciæ, and had lodged under the tendon of the lumbricalis of the index finger. It was done without pain, save where a nerve was divided. The incision healed without scar.

These facts, which the writer believes he is the first to point out, have theoretic relations of great interest which may be discussed in a future paper.—*American Journal of the Medical Sciences.*



## ARTICLE XI.

*Cystic Tumor of the Lower Jaw, with Giant-cell Elements.*

James H. B., 14 years of age, of Chester, Pa., came to the clinic on the 12th of October, on account of enlargement of the lower jaw of from two to three years' duration. His chin was a little prominent, especially on the left side; and on opening his mouth, the bone was seen to be expanded thereby forming a tumor of the ovoidal figure and of regular outline, extending from the canine tooth of the right side to the first molar of the left. The alveolar border of the growth was soft, and crackled like parchment when indented. The gum was natural in color; he had lost several teeth over the tumor, and the remaining ones were loose. No cause could be assigned for its appearance; it was devoid of pain except a slight aching during the past three weeks; its progress had been slow, but within the past three months it had about doubled itself. His grand-aunt died of cancer of the breast.

Having diagnosed a cystic tumor, Professor Gross made an incision into it on its anterior surface with an ordinary scalpel, and a thin brownish fluid escaped. There was a large mass of substance resembling fungous granulations attached to the inner walls of the cyst, which was scraped away with the chisel. The operation was attended with profuse hemorrhage; but it was promptly controlled by plugging the cavity with cotton wet with Monsel's solution.

The central portion of the mass bore a suspicious resemblance to encephaloid, and, on microscopic examination by Dr. W. W. Keen, he found "the small scraps of the central portion of the tumor, which were gouged out, looked exactly like the heart's muscles, and were scarcely less dense. When teased out, 'myeloplaxes,' or 'giant-cells,' or 'multi-nucleated cells,' were seen. The giant-cells formed, probably the four or fifth of the entire mass, and were very remarkable for their bizarre forms and numerous prolongations or processes.

The number of nuclei was from ten to thirty, and nearly all possessed one, and often two, brilliant nucleoli.

"The spindle-shaped and other forms of caudate corpuscles, and round or ovoid cells, constituted the remainder of the mass. These, also, were generally nucleated and nucleolated. Scarcely any intercellular tissue was observed, and fatty granules were very rarely found to any extent, save in two or three places. So far as could be judged without injection, the mass was not very vascular."

The plug was allowed to remain for several days, until it had become loosened by suppuration, when it was removed, and a piece of patent lint wet with sweet oil was substituted. After a few days, the tents were dispensed with, and the cavity was then syringed out every few hours with a weak solution of permanganate of potassa. There was a little erysipelas after the operation, with difficulty in swallowing and a circumscribed hardness beneath the chin; but it disappeared under the usual treatment, and he was discharged, feeling quite comfortable, on October 26.

He reported at the clinic, on November 5, in good general health, and with the cavity in the jaw much diminished in size.—*Clinic of Prof. Gross. Med. Times.*

## MONTHLY SUMMARY.

*Hygienic Information.*—As samples of the sort of trash which a confiding public is made to swallow under the name of hygienic information, one popular journal of health contained some time ago the startling announcement that to build houses with cellars underneath is a grave mistake, on account of the damp air which cellars contain (which would, of course, be entirely obviated by building directly on the ground); and in a later issue warns its readers against cutting their corns, on the ground that fatal and uncontrollable hæmorrhage is a frequent result of that operation. In another "health journal" a "Dr." Dio Lewis, of Boston, asserts that tomatoes cause a scorbutic condition of the gums, "a diseased action of the mucous lining of the aliment-



ary canal," piles, and loosening of the teeth, so that they can easily pulled out by the fingers; the latter inference being based on a case where a young woman, whose health had been failing for a year, was sent by her physicians advice into the country where she "learned to eat tomatoes," and "almost immediately her teeth became so loose that she was enabled to indulge in the amusement of removing about twenty of them. Of the periodicals dealing in sanitary information for popular reading, the only one that we have seen having the slightest pretensions to scientific accuracy is "*good health*," and even this would be improved if some of its contributors would refrain from displaying deep erudition in dogmatic statements concerning subjects which are still *subjudice*.—*Medical Gazette*.

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*Strychnine as an Antidote for Chloral Poisoning.*—At a meeting of the Berlin Medical Society, in November, 1860, Dr. Liebreich communicated the result of his experiments in search of an antidote for chloral poisoning.

His investigations have not been directed to the discovery of a neutralizing agent for chloral while it remains in the alimentary canal, but after it had entered the circulation. The primary action of chloral being upon the brain and spinal cord, and secondary upon the heart, he had sought for a remedy which had its immediate effect upon the latter organ.

It occurred to him that strychnine might meet this indication, which increased the force of the systole and lessened that of the diastole, the reverse effect of chloral. Experiments upon animals had confirmed its antidotal properties; its efficacy, however, being restricted to the profounder states of chloral asphyxia.

If merely hypnotic doses of chloral be given to an animal, administration of strychnine will induce the usual tetanic phenomena. This does not occur where the dose of chloral has been sufficient to affect the function of the spinal cord.

The fact was shown by the following experiments: A fatal dose of chloral was given to a rabbit, and death shortly ensued. The same quantity was given to a second, but as the respiration began to flag, a fatal dose of strychnine was injected (hypodermically). It soon roused from stupor, and perfectly recovered.

Two days afterward the same quantity of strychnine was again given, and death occurred in fifteen minutes. He therefore advises its use where the life of the individual is threatened from over-doses of chloral, at the same time employing the ordinary irritants and excitants.

During the discussion which followed the reading of the report, Dr. Von Langenbeck suggested that it would be difficult to determine the quantity of strychnine to be used subcutaneously in asphyxiated states from either chloroform or chloral.

Dr. L., from his experiments upon animals, estimates the dose at about 10 milligr. for adult individuals.—*Memorable Heilbronn. Chicago Medical Examiner.*

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*Death from Chloroform.*—Dr. George Johnson, in a letter to the Editor of the London *Medical Times and Gazette*, writes as follows:—

“Dr. Richardson, in his lecture on death from chloroform, referring to the *post-mortem* appearances in cases of what he designates epileptiform syncope, states that the lungs are blanched and bloodless, the left side of the heart and the systemic arteries empty; while the right side of the heart and the whole systemic venous system are distended. Dr. Richardson explains the appearances thus:—‘All through the body there is evidence on the arterial side of the circulation of intense arterial contraction. \* \* \* \* the arteries have poured their contents into the veins, and contracting firmly in their minute ramifications have shut up the blood in the veins, and produced complete arrest of motion throughout the circulation.’

“I find a difficulty in accepting this explanation of the facts. It must be borne in mind that the contraction of the minute muscular arteries has a stop-cock, and not a force-pump action, an obstructive and not a propulsive influence upon the circulation. Contraction of the minute ramifications of the systemic arteries would retain the blood in the arterial trunks, and not drive it on into the veins; and, again, driving the blood into the veins would not arrest the circulation if the blood were free to move through the lungs. The condition of the heart, lungs, and bloodvessels, which occurs in animals rapidly killed by chloroform, and which is also found in cases of acute apnœa, and of

cholera collapse, appears to me to admit of only one explanation. Contraction of the minute pulmonary arteries arrests the blood before it reaches the capillaries. The closure of the arterial stop-cocks in the lungs tends to empty the vessels in front, and to distend those which are behind the seat of obstruction; hence the anæmia of the lungs, and emptiness of the left side of the heart, and the systemic arteries, while the trunks of the pulmonary artery, the right cavities of the heart, and the systemic veins, are distended."

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*Removal of the Articular Extremity of the Lower Jaw with Restoration of Motion.*—Mr. Christopher Heath, University College Hospital, London, and Dr. J. E. Garretson, of this city, have each recorded cases of the removal of the articular extremity of the lower jaw with complete restoration of motion after a few months. In Dr. Heath's case the condyle was removed on the 16th of June, 1869, and in December the movements are reported to be as perfect as though no disease existed.

In Dr. Garretson's case the full left half of the bone was removed in January, 1866. The case was lost sight of about a month after the operation, and seen two years later, when the motion was found perfect. Both operations were for necrosis of the bone. *Med. and Surg. Reporter.*

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*Loss of Speech After Chloroform.*—The *London Lancet* quotes from a German periodical the statement that a servant girl inhaled chloroform for the purpose of having a tooth extracted. On awaking she had lost the power of speech, could not utter any sound whatever, and remained in that state for five weeks in spite of various remedies, especially electricity. After some time she began to speak in a low tone, and was put under appropriate treatment. It is supposed that she suffered during anesthesia from rupture of some cerebral vessel. She had never been hysterical.

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*Iodide of Potassium in Periostitis.*—Mr. Paget, in a clinical lecture at St. Bartholomew's, advises, in treating periostitis, repeated blisters. Iodine of potassium is useful, 1, in syphilitic periostitis; 2, less so in gouty periostitis; 3, less in scrofulous; 4, it has no power in chronic rheumatic arthritis.—*Med. R.*

*Neuralgia Pill.*—In the January number of the New Orleans *Journal of Medicine*, Dr. Osborn, of Greensboro, Ala., publishes the following formula, which, in his practice, he has found very effectual in the relief of neuralgic affections:

|   |                          |     |       |
|---|--------------------------|-----|-------|
| R | Zinci cyanidi.....       | gr. | vj.   |
|   | Quiniæ sulphatis.....    | gr. | ix.   |
|   | Morphiæ sulphatis.....   | gr. | iss.  |
|   | Extracti belladonnæ..... | gr. | iiij. |

M. et ft. mas. div. in pil No. vj. Sig. One pill every 6 hours till pain is relieved.

*Vehicle of Exhibiting Chloral Hydrate.*—Dr. NAPHEYS, in his "Modern Therapeutics" gives this formula:

|   |                       |                 |
|---|-----------------------|-----------------|
| R | Chloral hydratis..... | 3 ss.           |
|   | Syrup Tolutani.....   |                 |
|   | Aquæ.....             | aa. f. 3iii. M. |

Sig.—One to four tablespoonful for dose with water.

*Carbolic Acid Soap.*—A pharmacist sends the following formula to the *Drug. Circ. and Chem. Gazette* for preparing the *Sapo Desinficiens phenylatus Hageri*: Take freshly prepared cocoa-nut oil soap, 150 parts, and fuse; then add a solution of—

Alcohol, 10 parts; carbolic acid, 6 parts; caustic potassa, 2 parts; oil of lemon, 1 part, and mix with stirring. To be poured into moulds.

*Poisoning by Worm Lozenges.*—Dr. B. D. Gifford reports to the Boston *Med. and Surg. Journal* a case of poisoning of a child three years old, who had eaten seven "worm lozenges." The symptoms were those of strychnia, and indications of the presence of strychnia were found in lozenges from the same parcel. The vermifugal agent was supposed to be santonin. In the *U. S. Dispensatory* a similar case is related which occurred in France nine years ago. The patient was poisoned by what was considered an overdose of santonin, but strychnia was afterwards detected. How came the strychnia in the two parcels of santonin? Or was there some other toxic element developed in the manufacture of the santonin resembling strychnia in its physiological and chemical relations?—*Am. Eclectic Med. Review.*

## EDITORIAL DEPARTMENT.

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*Virginia State Dental Association.*—It is with great pleasure we learn that the convention called by a notice which appeared in the October No. of this *Journal* was altogether successful, and that an Association has been formed on a sound basis which promises to do much good to the profession in that State. We feel a warm interest in this Association not only on account of Virginia being our native State, but for the reason that the prominent movers in this organization are friends, classmates, and pupils; and aware of the energy and ability they possess, we are assured that they will maintain and support it in a manner which will soon cause it to be recognized as one of the most prominent in the South.

We are indebted to the Secretary for the account of the proceedings of the first meeting, which appears in the present Number of the *Journal*.

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*Guillois' Cement for Temporary Fillings.*—This cement has lately been introduced to the profession in this country, after a long trial in England where it has been favorably noticed by the most respectable practitioners. Chas. J. Fox, M. R. C. S., L., communicates the following to the "*British Journal of Dental Science*" concerning his experience in the use of this material:

"I have been for some time expecting to see some communication respecting this cement, recently introduced, as every one who tries it expresses privately extreme satisfaction with it. Where this is the case, I think it is only fair to say so publicly. It is of the same nature as that commonly called osteoplastic, but it differs from it in this particular, that it can be mixed to a consistency much resembling putty, and in that state can be manipulated for some minutes without setting irretrievably. If you use the other osteoplastics as thick as this, they set rapidly and are brittle; if you use them in a thinner condition, they run about the gums and teeth. When once set it is so hard, if it has been properly manipulated, as to turn the edge of the instrument should it be deemed requisite to remove it. As to its durability it is of course impossible to say much, seeing that it has only been introduced into England for a few months; but this may be said, that taking four months' experience with other cements, and four months' with this, I have found it so superior that I have entirely discarded all other osteoplastics, amalgam, etc. In small cavities in the incisors, or in shallow cavities where osteoplastics would wash out in a short time and dissolve away, Guillois' Cement remains at the end of four months as good as when it was put in. I can not tell what further experience

prove, but *so far*—and only for four months' experience do I speak—I have not had one failure, which is more than I can say of any other."

Four shades, two of blue and two of yellow are prepared and indicated by a sample attached to each package.

We advise a trial of it for temporary fillings and should be pleased to hear of the results.

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*Tobacco and the Parotid Gland.*—The "Herald of Health" in an editorial on the perverted use of saliva says, "tobacco greatly excites the parotid gland so that when this substance is in the mouth it pours out a great amount of saliva to dilute and wash away the offending substance. In this case it becomes lost. It may be an interesting fact to some of our readers to know that so great is the demand for saliva in the mouths of tobacco chewers, that nature has to provide for this increase by enlarging the parotid gland. Surgeons when dissecting this gland in tobacco chewers, have often noticed this to be the case. If the tobacco did any good, there would be no harm in this; but as it does not, the harm comes from wasting our forces unnecessarily. Persons who have more force than they know what to do with may not be much harmed by this waste; but this number is few. Most of us have none too much strength, even when all of it is saved for best uses, so the folly of habits such as that of using tobacco wastes our strength, and is so filthy that it ought to condemn itself if it produced no physiological injury."

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*A Gold Medal* is offered by the "Odontological Society of London," for the best essay on the minute structure of the teeth. Essays are to be sent under a motto, accompanied by a sealed envelope containing the author's name and address under the same motto, to the President of the Society, 31 Soho Square, London, before the 31st of December 1871. We express the hope that this medal may come into the possession of an American.

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*Dental Items.*—In the November No. of the *Canada Journal of Dental Science*, a writer recommends cotton thoroughly saturated with *os-artificiel*, which, (while soft,) is pressed between crowded teeth which have been previously separated, to retain the space already gained until the sensitiveness has in a great measure passed away, thereby saving the renewal of the wedges.

For years past we have been using for this purpose, cotton saturated with sandarach varnish, which hardens as soon as water comes in contact with it, saving the time necessary for *os-artificiel* to harden, and besides being more conveniently applied.

In the November No. of the *Dental Cosmos*, a writer recom-

mends the use of *os-artificial* in vulcanite work, as a protection to the joints between the blocks of gum teeth. This material has long been used for this purpose, and the suggestion is not a new one; but closely ground surfaces afford better protection than any material either pressed between the joints or put over them. In the first instance, if the *os-artificial* is placed between the joints, a thickness of it will show; or a space corresponding in size to the quantity of the material applied over the joint will be left, especially between the gum extremity of the blocks and the rim of rubber.

In the *Dental Office and Laboratory*, Dr. O. Lund, alluding to the difficulty of soldering aluminium, says: "I have never failed in making the solder adhere by using a spirit lamp, the 'extra' solder, and a small soldering tool made after the pattern of a common soldering iron. The plate is first made clean by thoroughly scraping it, and is then merely 'tinned' with the aluminium solder, scraping the excess off, and the block-tin, or any of the fusible metals will flow upon it without any trouble."

Dr. Lund suggests that "the manufacturer coat both sides of an ingot of aluminium with pure tin, united to the ingot by means of a solder composed of an alloy of the two metals." Of course these coats must have a much less relative thickness than the ingot, each coat being, say, one thirty-second or one sixteenth the thickness of the ingot. Next roll the whole out in a mill until it is sufficiently thin for dental plates, and we have as the result an aluminium plate, covered with a thin coating of tin, ready for "striking up" and soldering, without difficulty."

He also claims another advantage by the method he has suggested; "we avoid the galvanic action that is apt to be generated by the aluminium metal and the solder or tin being brought into contact, side by side, with the membranes and fluids of the mouth."

This suggestion of Dr. Lund's is one of interest to the profession and may lead to a method by which the difficulty in working aluminium may be greatly lessened.



THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.    THIRD SERIES--JANUARY, 1871.    No. 9.

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ARTICLE I.

*"Germinal Matter."*

A Lecture delivered before the Class of the Baltimore College of Dental Surgery.  
By Professor H. R. NOZL, M. D.

GENTLEMEN :—In the preceding lecture, the question of *Vitality* and "*The Vital Forces*" claimed our attention ; to day I will but state the conclusions at which we arrived, and then pass to the discussion of the subject of "*Germinal Matter*."

The first conclusion at which we arrived in the discussion of *Vitality* was this :

*"Vitality is inseparable from organization"* ; and our next was that it was not an entity, not a thing distinct in itself, but the result of

*"Physical Forces passed through an Organic Germ"* ; that there were only three manifestations of *Vital Force*, viz :

(1) *Assimilative* (2) *Reproductive* (3) *Developmental* ; and in these three expressions, the vegetable and animal kingdoms are one ; mere vitality can give no other, and has no other expression of force ; finally, that this element common to the two kingdoms, constructive in each and only constructive, had nothing whatever to do with

*"The animality or exhibition of Animal Forces"* found in the animal world, save 1st. to construct, 2nd. to repair



the waste produced by the working of those systems, which it had constructed and in virtue of whose working the forces we term—*muscular—nerve—and brain force*—were obtained; this element or this active working agent is the only thing which can or which does exhibit the true expressions of Vital Force, therefore *Vital Force* is simply constructive, simply histogenetic, and *Vitality* belongs intrinsically to this Germinal Matter.

What then is *Germinal Matter*?

Anatomically it is the *Nucleus* of the older writers; the *cell* of Virchow and others; it is the *Nuclear matter* of Chambers of London; it is the *Protoplasm* of Huxley; it is the *Constructive Basis Element of Organic Life*; and anatomically it is never larger than 1000th. of an inch, or much smaller, spherical—transparent or semi-transparent minute speck,—a ball of jelly,—often faintly granular, watched under the microscope it seems, if fresh and warm, in constant motion; increases in size,—buds, divides; serving still more closely its action, we trace little currents of nutrient fluid to and from it, and find that one simple mass may give origin to many others, all exactly alike, nearly so, and all possessing the general outline, size, form, and characteristics of the parent mass, and inheriting its vitality.

WHERE DO WE FIND THESE MASSES OF GERMINAL MATTER?

The answer is plain, they are found wherever organic structure is to be built and wherever organic structure is to be repaired. As regards the human body, they are found in every tissue, every organ, every structure, and in every place and in every place they have but one office, one simple function, that is, *Construction—Histogenesis*.

Primarily they produce the ultimate anatomical elements of all tissues, organs, and systems of organs; secondarily they repair all waste from either functional activity of tissue or organ, or waste from mere natural shedding or moulting, such as replacing our lost hairs, healing wounds, restoring our shaved beards, replacing nails torn off or crushed

lost by inflammatory action ; so you will perceive they are never idle, eminently useful, always working either to restore a lost fragment or to construct a new element ; in a word the very integrity of each tissue, each organ, each system, and the integrity of the organism as a whole, depends upon the sleepless vigilance of these microscopic masses, these balls of gelatinous material,—this Germinal Matter ; or Constructive Basis Element of Organic Life.

In the blood they are called *white blooded globules* ; in areolar or connective tissue they are called *connective tissue corpuscles* ; upon the derm of skin and mucous membrane they are called *mucous globules* ; in bone they are called *bone corpuscle* and *lacunæ corpuscles &c.* ; but wherever found they are anatomically the same working factors, and possess no physical characteristics by which we can tell the tissue they are to produce ; the Germinal Matter of bone, connective tissue—muscle—skin and mucous membrane &c., can not be distinguished, and therefore have no true anatomical differences, the masses in each tissue being apparently identical.

#### HOW THEN ARE SPECIAL TISSUES PRODUCED ?

This is a fair question, and a very natural one, and I am truly sorry I cannot answer it as fully as would be desirable ; frankly, I cannot tell why masses apparently of identical composition, structure and physical characteristics should possess physiologically such diverse developmental powers. I will give you the facts, and the history of their developments, but I cannot explain *why* they possess these special manifestations of vital force ; as a fact the tissues are produced "*in virtue of a special power inherent in and resident in the Germinal Matter of the special tissues,*" this is all we know. This is an absolute,—an ultimate truth, susceptible of most practical demonstration as I will readily show you. If a piece of the periosteum of bone, be removed and implanted while still warm and fresh upon the skin, it will produce in its new home the same tissue it produced in its old home ; in other words it will produce bone. The piece

removed contains bone corpuscles, and these bone corpuscles have the special power of producing bone and not skin; hence when transplanted they retain that power and actually live, grow, and develop but they *develop as bone*. The mucous globules of the skin possess the same power and may be transplanted successfully and be of great practical value, as the following statements will show; Prof. J. J. Chisolm, eminently the practical surgeon, and Doctor of the Medical Faculty of the University of Maryland, under his charge at their college hospital, some cases of intractable old ulcers; he exhausted his patience and skill upon these proverbially obstinate lesions, and finally considering them fit subjects for experimentation, he commenced a process of "skin budding," *i. e.* took snips of healthy skin and put them in little cuts and niches made in these ulcers; now these snips of skin were fresh and warm—contained healthy mucous globules or masses of Germinal Matter, they immediately, pardon the phrase, *took root*, so to speak, and grew off, giving him numerous islands of healthy skin in this denuded surface; the islands increased in size, united their edges, and he absolutely *skinned over* these ulcers by this process of skin-grafting, or skin budding; he cured them, healed them up by virtue of the special power inherent in the Germinal Matter of special tissues. This may appear strange, but you will be more surprised when I tell you that many of your fathers have performed the same operation; you are aware that among farmers and horticulturists there is a process known as *budding trees* &c., now this is nothing more than M. Ollier did in his skin grafting or budding, or than Prof. Chisolm in his *skin budding* of ulcers, has done in the animal kingdom—the two processes physiologically identical and depend upon the truth above stated.

Bone diseased by cancer will often give rise to cancer in the lungs, liver, &c., but always to "bone cancer," for vessels ulcerating through, take up the bone corpuscles tainted with cancer, and, wherever in the circulation the

may be arrested, they are liable to give rise to both bone and cancer; for they preserve intact, though transported to distant organs, the power to produce bone and the power to produce cancer.

In that terrible disease syphilis, it is probable that the phenomena of its secondary or constitutional effects, can be explained upon this very principle; each diseased gland, or ulcerating surface might act as a depot of infection and further contamination. From these facts you can at once perceive, how important a truth this is and how essential that we should know at least the condition and laws of its manifestations though we are utterly unable to explain the *whys* of such phenomena; we cannot determine the *final causes*, but we may attain a knowledge of the physical conditions, and physiological and pathological laws which govern the phenomena.

Special tissues then result from special powers resident in the Germinal Matter of these tissues, and each tissue is the result of the expression of the 3d., or developmental power of the Germinal Matter; the masses from bones, muscles, tendons, mucous membrane &c., have the 3rd. power, the product of its exhibition varies with the tissue examined, and there are no anatomical characters by which we can by an antecedent examination determine what this product will be.

#### THE SIZE OF GERMINAL MATTER.

I stated that this organic basis element never attained a size larger than 1000th. of an inch, and might be almost immeasurably small; now a doubt might arise as to the ability, of so small a working agent, to produce the different tissues, organs &c.; this objection is more apparent than real, for a microscopic analysis of the ultimate anatomical tissue elements, reveals the fact, of a striking relationship as regards size, which the following statement will verify:

Ultimate Fibrillæ of muscle 5000th. to 10000th. of an inch. Ultimate Nerve Fibrillæ 1000th. to 10000th. of an inch. Blood Globules, 2000th. to 3400th.; Ossicle of bone 500th. to 2500th. Enamel Rods or Columns 5000th. of an

inch; Dentinal Fibrillæ 10000th. to 20000th.; and other elements in the same ratio; now these elements make up the animal fabric, for it is by a multiplication of similar elements and not by the introduction of new ones, that the body is constructed; for example ultimate, fibrillæ of muscle 10000th. of an inch in diameter, packed in a sheath, called *Sarcolemma*, will give an ultimate fibre 350th. to 1000th. of an inch in diameter; these fibres connected by a fine connective tissue give fasciculi; these fasciculi in bundles give complete muscles. The history of the physical structure of muscles is the history of all complex tissues, they are all built of microscopic elements, blended, repeated, interwoven, until we get structures as different from the original elements, as the richest brocade silks are from the raw material, just removed from the cocoon of the bombyx mori—or moth of the silkworm.

Therefore, since it is by a repetition of smaller elements that we get the larger anatomical forms, the size of germinal matter so far from being against the truths I have stated is in fact a most striking argument in their favor; this microscopic factor, in virtue of the three powers characteristic of vegetative life \*\*, is fully competent to construct the elements of which the human organism is composed, and being competent for its primary construction they are equally competent for repair of injury, waste, or normal moulting of substance by molecular disintegration.

In general terms then, it may be said that all naked anatomical elements are composed of microscopical elements and these latter elements have been derived directly from the Vital Force of Germinal Matter. \*\**Assimilation and Reproduction—Development.*

#### THE CARMINE TEST OF DR. LIONEL S. BEALE.

In a former lecture, I told you that the histogenetic agency and the animal working elements of muscle were by means identical, and possessed very different powers; the first is of course the Germinal Matter, and the latter is the muscular fibre composed of ultimate fibrillæ; the one p

sesses the three vegetative powers, *assimilative—reproductive* and *developmental*; the other, i. e. the fibre has the one single power of “*contractility*” and gives us by this power “*Muscular Force*,” but it has nothing to do with the vegetative Forces; it cannot repair its own waste, and so far as *nutrition* is concerned it is perfectly passive, but so far as *motion* is concerned it is eminently active; the germinal matter and the formed tissues have in this instance totally different functions, and the one never could assume the other's position. When germinal matter exhibits its developmental power, it ceases to be germinal matter, and in that very act becomes changed into a formed tissue, which may have other and perhaps higher functions, but which can never again be germinal matter, therefore never again exhibit the Vegetative Force. This being true of germinal matter and formed tissue in muscle, it will be found true of them in all tissues, or structures of the body.

Can these two things be accurately distinguished? Dr. Beale answers this in the affirmative, and gives numerous diagrams representing a great variety of tissues in proof of his position. He uses a preparation of carmine which stains red the *Germinal Matter*, but does not affect the formed tissue, or effects it so very slightly that it can be readily removed. He uses two terms to distinguish the histogenetic factor and the material this factor elaborates, he calls the one, as I have already told you, *Germinal Matter*, he calls the other Formed Material; so all tissue is Formed Material with Dr. Beale; he says “*Germinal Matter removed from any organism which was recently alive, is tinged red with carmine, and preserves the color permanently when preserved in glycerine. Formed Material is not colored, but if it be stained, owing to the solution (carmine) being too strong the stain is removed by soaking in glycerine;*” from this you will perceive that he makes an accurate yet simple distinction between them. Dr. Beale having obtained his means of distinguishing the two, proceeded to examine under the microscope the different tissues of the body and traced out

by close observation from comparative anatomy and rigorous experimentation, the evolutions of the various ultimate anatomical elements, and demonstrated their relations to the germinal matter in so clear and so forcible a manner, that we are now in the possession of information as to the histogenesis of the human body, which will radically change both modern physiology and pathology.

He conclusively proves the nutritive or histogenetic activity of germinal matter, and the complete passivity of Formed Material, so far as nutritive action is concerned. He proves that a muscular fibre once formed, remains, so long as vegetative force is involved, perfectly passive—it may contract—it may slowly disintegrate by molecular changes—but it never gives one single proof, or one particle of evidence of being *alive*, so far as the vegetative forces may be considered as an evidence of life; the fibre never assimilates, never propagates, never develops itself, but remains quiescent as regards Vital Force, until it is worn away by use, or destroyed by gradual moulting. I candidly confess that there is just at this point, some rather nebulous ground, and I will state it freely, it is this: *as given by Beale, Huxley, Chambers, &c., Germinal matter alone possesses Vitality*, while the Formed Material, though itself the result of the expression of the third power, or highest possible expression of Vital Force, is not really *alive*, is not vegetatively alive, but remains perfectly passive in respect to this force. This Formed Material may have high powers, as muscular and nerve and brain force for example; or its function may be a purely passive or even a mechanical one, as the hair, nail, bone, cartilage, enamel, dentine, &c.; now these structural tissues, etc., being nothing more than the formed material of the germinal matter, and having no claim to any vitality or quality or property (or expression of vitality), yet remain often months after their formation before they are moulting or used up in the functional activity of the systems of animal life, and during this interval are component parts of the organism. How shall we designate them, if not alive?



they dead? If dead why do they not at once undergo putrefaction? Why if indeed not alive, do they not give us the evidences of death, i. e. rapid chemical change? The formed tissues certainly never return again to the state of *basis* or constructive element, and therefore can never give any evidence of Vegetative Force, thus they are not alive, in the sense in which the *word* is used in reference to the vegetative kingdom, yet they are as regards the animal, the very machinery by which it is enabled to give evidence of its animality, "hence are as necessary to an expression of animality" as germinal matter is to the expression of vitality; the question therefore, as it now stands, can only be properly understood and scientifically discussed by making a sharp distinction between the *constructive factor* and the *machinery* which it constructs; to the working constructive agent we assign vitality, to the constructed machinery we assign *animality*. Now the animal machinery once constructed remains in working order about four or six months and then if not repaired or replaced by new material it begins to undergo a degeneration; one of the first is a *fatty change*. It is probable that all nitrogenous tissues are renewed every four months; four months is their healthy term, and after this they must either be renewed, or the machinery suffers from direct degeneration of the material of which it is composed. Machines of wood, iron, steel, silver, gold, &c., last often for many years, requiring repair only at long intervals, but yet all undergo more or less of constant wear or loss by use; and in the working of the animal machinery there is also wear or loss by use; this wear is incessant during the activity of the animal, it is molecular or interstitial, or as I might better express it, *atom by atom*; this atom by atom loss, whether from functional activity or normal moulting, has to be met by a coincident or nearly coincident atom by atom repair, else the integrity of the machinery suffers; for this repair rest and food are necessary, i. e. time and material.



Practically, you have often acted upon this very truth; you would not drive a horse for two consecutive days and nights without rest or food; you would not drive him eighteen consecutive hours without rest or food, unless the case were one of extreme emergency, and then you would feel that you were doing the animal an unavoidable wrong; you would be guilty of excessive waste of animal machinery without giving time or material for repair; you may run your watch for twelve months without repair, you cannot use any animal machinery one day without repair, except with detriment to the animal. The physical machinery is repaired by the proper mechanic, but the animal machinery carries its own element of repair as well as of prime construction; the germinal matter, the nuclear matter, the proto-plasm, the basis element of organic or vegetative life.

Vitality and Animality are widely different, but Animality is directly dependant upon the vitality of the histogenetic element, which primarily constructs and afterwards maintains the integrity of the machinery in virtue of which action, Animality exists.

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## ARTICLE II.

### *Review of an Article Entitled Dental Hygiene.\**

By Prof. S. P. CUTLER, M. D., D. D. S.

(Read before the New Orleans Dental Association.)

This singular production, notwithstanding its flowing and elegant diction, has some feeble and weak points according to scientific dicta.

On page 183, the author says "The capillary net which derives its nourishment from the systemic circulation constitutes the source of vitality to the teeth, and to keep them in an active healthy condition so as to perform its function and build up and establish those hard and unyielding structures &c."

This capillary net work spoken of above, as I understand

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\*This Article was published in the August Number of *Journal*, copied from the *Dental Times*."

the subject, constitutes the connecting link between the veins and arteries, a part or parcel of the systemic circulation, and constitutes the chief points of nutrition though taking place outside of the flowing tide.

Same page says, "The human teeth are of that class of organs which are not in direct relation with the blood vessels, and yet which derive their whole nutriment and the material of their functional operations from the blood. In all respects they are a separate and distinct creation."

What an incongruity there is in the above statement. He does not seem to regard the highly neural and vascular pulps with their vessels and nerves coming into their interior direct from the dental arteries and nerves entering into the apices of fangs, as constituting any direct connection with the blood vessels. I certainly shall differ with him as I regard the connection intimate to the fullest extent of the term.

I have been led to believe that the teeth unite or combine in themselves the three great systems, so far as they go, that is dermal and neuro-hermal in the highest state of perfective development, equally as much so as the skin, with this main difference that the external coat of the teeth, the enamel, does not exfoliate like the epidermis, owing to its extreme hardness; in all other respects they are homologous.

On page 184, the writer says, "speaking of capillary nutrition in tissues and the complex organism, nature and structure of teeth being such as to deprive them of recuperative action, stagnation leading to decompositions and decays are the result."

Now if stagnation in these tissues leads to decays and decompositions, why do we not find a similar result taking place in the bones themselves throughout the entire organism; they being very similar in compositions, only less dense and always being covered up, thereby precluding the possibility of local decays, except in cases of necrosis, like the teeth, in consequence leading to the conclusion that teeth decay

*de loco*, mainly independent of systemic influences so far as decays *per se* are concerned.

I do not wish to be understood as advancing the idea that all teeth are equally well developed and capable of the same resistance to external influences by any means.

Page 186 speaking of the three tissues composing teeth says, "And arrangement gives the cementum, the position nearest the vascular tissues, because of its better adaptation to hold the fluid thrown from the blood vessels imbibed by the capillaries of the more highly organized structure of the dentine.

In speaking of the dentine I am unable to comprehend his meaning unless he refers to the tubuli.

Must we look to the cemental membrane for nutrition of the dentine, if so how are we to account for the interior sensibility of the whole tooth when the fang has been denuded of its periosteum nearly to the apex for years which we often witness. But when we look to the blood vessels and nerves entering the interior of the tooth at the base of the fang, we have no longer any difficulty so long as they remain intact in accounting for this sensibility and its vital manifestation.

The periosteal membrane, which the writer assigns to extraordinary functions, cannot, in my opinion, be considered or regarded as anything higher than ordinary periosteum holding only a low office in the economy as furnishing nutrition to the cement in part and to the alveolus, and a bond of union or connection between jaw bone and teeth, not furnishing sensorial vitality to any extent to the dentine, if the cement only in part or limited extent.

Same page, writer says: "The dentine is perhaps the most delicately organized fabric within the entire range of the economy." "The capillary vessels contain a fluid composed of the finest particles of the body."

The writer does not mention the subject of tubular fluid, only a fluid occupancy, thereby still adhering to Kollmann's old fluid hypothesis.

On page 187 He speaks of articular cartilage vessels in connection with capillary."

It is well known that cartilages as spoken of above, have no circulation, as they have neither vessels or nerves, only osmotic for nutrition.

The articular are the most perfect and complete of all the cartilages in the organism.

Page 188 says, "Irregularities in the capillary circulation have been noted when the systemic circulation was in a perfect condition."

The writer speaks of the capillary circulation as independent of systemic to some extent, as though the capillary did not form a part and parcel, and the most essentially vital too of the systemic circulation. Then how could the one be disturbed, and at the same time the other, not only where the local disturbance is exceedingly limited, and where the circulation could easily pass around the disturbed point with any serious disturbance; this could not well apply to the disturbance in a tooth to any considerable extent without producing more or less general disturbance.

Page 180 says "the liability of teeth to decay through an undue acceleration of local or capillary circulation from which there is a gorging or choking of the tissues, thereby interrupting functional power and producing results similar to an enfeebling insufficiency of capillary nutrition." After a tooth is once fully developed it matters but little whether or not there is a due or undue amount of circulation in the capillaries of tooth pulp; so long as the mouth is not in an acid condition there will be no decays, the circulation carried on in the interior of a tooth having no sensible effect within a limited time on the condition of the dentine. In this statement I am not denying the fact that slow and gradual changes do go on in the dentine from youth to old age gradually becoming more earthy and closed and less vital, even in some instances perhaps of diminution in density of dentine, consequently of earthy

matters, rendering the teeth less resistant to local influences the cause of decays.

Page 191 says, "In the softer tissues these pathological conditions can be arrested before inflammation or stagnation sets in but in the denser or bony tissues and especially those forming the teeth the remedy cannot be applied; internal deposit cannot be corrected or reduced to a normal standard and a stagnation is the result which finally produces disorganization and decay.

Now if decays of teeth depend on internal causes alone we certainly would have no knowledge of a decayed condition of a tooth until the outside should fall in leaving the nerve exposed, and no chance for filling only on an exposed nerve, and who has ever seen this character of decay? I can safely say no one.

Now that changes are constantly taking place or going on in teeth, as in all other living animal structures, I am ready to admit, as such is a recognized fact.

There is no such thing as standing still any where in the universe, all things are in motion and undergoing change.

That there is different degrees of density in teeth of different individuals I am fully aware, and that teeth containing a minimum amount of earthy salts more readily decay than other things equal, I am also fully aware and *vice versa*.

That something like *mollities ossium* which might more properly be denominated *mollities dentium* sometimes takes place in individual cases, I have no doubt, which may depend on systemic causes such as an acid diathesis, if pervading the entire organism at least the regions about the teeth, removing the lime salts to such an extent that the teeth decay in a most rapid manner; in all such cases one may expect to find an acid condition of the mouth. In the same way as in all other forms of decay, an acid is the factor employed in the work; I might add that all such decays are of the brownish or white variety with few if any exceptions.

In such cases the bones themselves may or may not

seriously involved, owing to the fact of the condition being general or local in its character.

In saying this much I am assuming a little, as the data at present extant is somewhat limited. There are other cases of softening of teeth or rather destruction from the use of elixir of vitriol and muriated tincture of iron, where the surfaces of the enamel first and subsequently the dentine, is extensively softened and decayed away with characteristic appearances familiar to all dentists of long experience.

In such cases where the remedy has been long continued even an acid diathesis might be anticipated sufficient to co-operate in the local distinction, the bones even in some instances may be temporarily implicated but subject to subsequent reparation.

So even in case of the teeth after the cause of the softening is removed, subsequent hardening may and does take place if the process be not too long continued and the destruction too extensive, especially if from constitutional causes.

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### ARTICLE III.

#### *Report on Dental Chemistry.*

By Dr. JOHN ALLEN.

Read before the American Dental Association.

As organic chemistry treats of the substances which form the structure of organized bodies and their products whether animal or vegetable, let us look at dental chemistry a moment from two stand points, viz. : the constituents of which the teeth are formed, and the source from which those constituents are derived.

According to Johnston's chemical analysis, the constituents which enter into and are embodied in the osseous structure of the human teeth are as follows :

Phosphate of lime, with traces of fluoride of calcium, 66.72; carbonate of lime, 3.36; soluble salts, 0.86; cartilage, 27.61; fat, 0.40, : phosphate of lime, 1.08.

The enamel, or vitreous substance which covers the crown of a human tooth, is composed of phosphate of lime and traces



of calcium, 87.82; carbonate of lime, 4.37; phosphate of magnesia, 1.34; soluble salts, 0.88; organic substances, 3.39; fat, 0.

These constituents form the basis of the bones and teeth of a person. In order, therefore, to produce a good osseous structure of the human frame such articles of food should be used as contain a due proportion of these constituents, such are the operations of nature in the animal economy, so that when food is taken into the system it is duly assimilated and converted into muscle, bone, fat etc. For this purpose the necessary materials of which our systems are formed exist in the proper nourishment designed for man. But by the present mode of preparing certain articles of food (some of which we will notice) a large portion of the essential elements for osseous formations are taken out and discarded. For example, the wheat, rye, etc., of which bread is formed, is stripped of the hull and coarser portions of the grain which are requisite materials for bones and teeth, as deduced from the following well authenticated chemical analysis, by which it is found that in 500 lbs. of whole grain there is:

Muscle material, 78 lbs.; of the fat principle, 12 lbs.; the inorganic elements for bone, etc., 85 lbs. 500 lbs. of fine flour contains: muscle material, 65 lbs.; fat principle, 10 lbs.; bone material, 30 lbs. 500 lbs. of bran contains: muscle material, none; fat principle, 30 lbs.; bone material, 125 lbs.

The foregoing facts should teach the importance of using such food as contains the requisite elements for development and sustaining a perfect organism in all its parts.

By close and careful scientific researches we have sufficient light upon this subject to serve as a guide which we should follow, for nature is so independent in the administration of her laws that those who disregard or depart from them must abide the result. Food for children ought to be plain and substantial; such as bread, milk, eggs, potatoes, rice, beans, etc. These constitute the principle articles of food necessary for a good development of the human system.

Adults require the same constituents to sustain the organization of the body that the young do to produce it; otherwise deterioration and decay ensue. More meat may be used as persons grow older.

Condiments possess none of the necessary elements for producing or sustaining a healthy organism.

Candies, which contain poisonous substances, (as many of them do), are detrimental. Many of the confectioners in coloring their candies, etc., employ the following materials: For their greens they use Brunswick green, carbonate of copper, or arsenic of copper. For their yellows, chromate of lead, or gamboge. For their reds, red lead, vermilion or cinnabar; and for their whites, white lead. All of which are poisonous. Although some confectioners use coloring ingredients comparatively harmless, such as saffron, French berries, Persian berries, fustic wood, etc., for yellows; for reds, cochineal, including carmine, Brazil wood, and madder; for blues, litmus and indigo; for greens, mixtures of any of the above vegetable yellow with indigo. If the eye *must* be gratified as well as the taste, in these matters, the latter colorings are far preferable to the former, but the purchaser of the candies can seldom tell the one from the other, therefore it is better to use them sparingly.

There are many articles of luxury used that are deleterious to the general health when indulged in too freely; that do not act directly upon the teeth, but indirectly prove injurious by producing vitiated secretions which affect them. Pure saccharine substances, when used moderately, are not considered injurious to the teeth, but when used in *excess* they become detrimental. When these are taken into the system they are converted into lactic fluid. If this becomes predominant in the salivary secretions it attacks the lining portions of the teeth, and thus produces decay.

Now, as a profession we should do all in our power to diffuse practical information with reference to the best means of forming and preserving the natural teeth, for however perfect we may be able to construct artificial dentures, man



can not do the work of his Creator as well as he can do Himself.

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#### ARTICLE IV.

#### *Use of the Sesqui-Chloride of Chromium in Sensitive Dentine.*

By GEO. S. YINGLING, M. D.

While on a visit to my home in Tiffin, Ohio, I was requested by Dr. Bricker, of that city, to procure for him on my return to Baltimore, a small quantity of the Sesqui-Chloride of Chromium, for the purpose of applying it to a cancerous breast.

He stated that its action, when applied for the removal of cancerous growths, was peculiar; accomplishing the result thoroughly by a sort of disintegrating or crumbling away process and entirely painless.

With some difficulty I procured the chromium, but before sending it to Dr. Bricker, I showed it to my preceptor, J. H. Ludwig, M. D., D. D. S., and made known to him the name of the article, and the purpose for which it was procured.

Having at that time an engagement with a patient, whose teeth were exceedingly sensitive, and being somewhat at a loss what agent to use in order to relieve the hypersensitiveness in the particular tooth which he intended to fill, then, most of the agents having already been used unfavorably, the idea occurred to him that the chromium might effect the purpose desired.

The following is an account of Dr. Ludwig's case in his own language, which I apprehend will be both useful and interesting to the profession:

"The tooth I selected for testing the merits of the sesqui-chloride of chromium, as an agent for the treatment of an inflamed dentine, was but slightly decayed, the caries having penetrated but little further than the enamel.

"The sensitiveness was of such an exalted character that cold fluids and even the cool air would affect it painfully.

The application of an instrument would produce extreme torture, and I found it simply impossible to excavate it without inflicting upon the patient intense suffering, unless I could first destroy the morbid sensitiveness by the application of some medicinal agent.

"For this purpose I tried in succession, carbolic acid, chloride of zinc, chloroform and chloral hydrate, but without favorable results. In each case the application of the above agents was followed by great pain.

"When, therefore, Dr. Yingling mentioned to me the action of the sesqui-chloride of chromium on cancerous growths, viz: that it caused the diseased part to come away by a kind of crumbling process, and without pain, the thought occurred to me that it might act favorably upon the case I then had in hand, if not in all cases where the use of such an agent became necessary.

"I accordingly applied a small quantity of the sesqui-chloride in a semi-fluid condition to the cavity of decay. Its application was followed by some pain, which was however of short duration, and may have been owing to the previous application of other agents, or to the too concentrated form of the chromium. The chromium being of a green color, the dentine was stained and presented the same hue.

"The surplus chromium was now removed, the cavity excavated and properly shaped *without any pain*, but there being some discolorization left, I concluded to defer the filling of the cavity with gold for several weeks, in order to see what effect time would have upon the texture and color of the cavity, keeping it in the meantime filled with Hill's stopping.

"At the expiration of about three weeks, I removed the temporary filling and found the discoloration had disappeared, and the dentine perfectly firm, and free from sensitiveness.

"I have used it in other cases, but in these cases the sensitiveness was not great, and other agents probably would

have done as well, but in all instances where I employed favorable results followed.

"I also employed it in a case of *morbid growth of the gums*. The gums were extremely vascular, discharged a very offensive matter, and had in them a constant burning sensation. The patient, formerly a healthy woman, had, living on the plains, where she was in a measure deprived of fresh meat and vegetables, contracted scorbutus, and the morbid growth was no doubt owing to the existing cachexia.

"I applied the chromium a number of times, but it did not realize my expectations, while Nitrate of Silver acted kindly and efficiently."

Being a student at the Baltimore College of Dental Surgery at the time, and being called upon to operate in the Infirmary, upon teeth more or less sensitive, I took a small quantity of the chromium with me, and made known to Dr. Clark, our gentlemanly demonstrator of operative dentistry, its nature and action upon diseased growths. He kindly suggested to me the name of Mr. King, one of the students, as a suitable person upon whom to experiment, having teeth very much decayed and in an extremely sensitive condition.

Mr. King very willingly consented to have an application of the chromium made to his teeth, the result being most satisfactory, as will be seen by a history of the case as given by himself, and which I append.

"My teeth decayed early in life, and I was in consequence obliged to endure many weary and tedious operations, in order to rescue them from the ravages of the destructive agent at work in them. A history of my case, may, therefore, be the means of lessening, if not entirely obviating others, the torments which I have endured for the last twenty years on account of the hypersensitiveness of my teeth. When a youth my teeth were comparatively good and I had each one attended to as deemed necessary by my dentist. I owing to neglect the decay in them progressed rapidly. Beginning at the central incisors it attacked the great

part of the dentine, leaving the remaining portion of this tissue in such an extremely sensitive condition that thirst was often more preferable than a drought of cold water, cold air, or any cold substance would affect them acutely; and I have often refrained from a hearty laugh for fear of the air coming in contact with them, and giving me the most exquisite pain.

"From the centrals, its ravages continued around the entire arch, until all the superior teeth were invaded. They were no longer of any benefit or comfort to me—but a burthen, and I came to the conclusion that mine was an unusual case, so aggravated that there was no relief for me but to have the offending members extracted. About this time I commenced the study of dentistry, and began to investigate the case for myself. I tried in succession the various agents commonly used in such cases, but to my utter discomfort, found every one to end in failure.

"While attending the Baltimore College of Dental Surgery this winter, I had them examined by several of the Faculty who, in view of their decayed and hypersensitive condition, advised their extraction.

"Being thus convinced of their irreparable condition, and therefore taking but little interest in their future preservation, I permitted them to be experimented upon by Dr. Yingling, a student in the College, who was desirous of testing a new agent—the sesqui-chloride of chromium—upon them.

"The Doctor accordingly made an application on one of the incisors, and to my great astonishment and relief it acted like a charm. I could afterward apply any cold substance to them without any painful sensation whatever, the same being true also in regard to the excavator.

"Had I met the Doctor and his chromium a few years ago, I might now have a good set of my *own* teeth, borrowing the advertisement of operative dentistry, which they would have displayed on account of the decay being mostly on the labial surfaces.

"I hope soon to see this agent extensively used by all operators who would perform comparatively painless operations, for I feel that from its favorable results in my case that it will prove an efficient addition to the list of agents already in use for the treatment of sensitive dentine."

I applied the chromium to an incisor in Mr. King's case by mixing it with water to the consistency of cream, carrying it to the cavity of the tooth upon a pledget of cotton. The tooth which before the application was so sensitive afterwards was found to bear the burr-drill without pain; the sensitiveness did not return for three weeks, and the tooth but slightly.

Prof. Gorgas, and many of the students have since used the chromium with equally good results.

The chromium when applied to dentine, colors it dark green, but does not penetrate far into its substance and may be easily removed with the excavator, or, if left alone, will disappear in a few days. The enamel is not affected by the stain.

I should be pleased to have the members of the profession try this agent on sensitive dentine and report their success to the journals.

## ARTICLE V.

### *Report on Operative Dentistry.*

By W. H. MORGAN. D. D. S.

Read before the Southern Dental Association.

MR. PRESIDENT AND GENTLEMEN OF THE ASSOCIATION:—  
Your committee on Operative Dentistry would submit the following report:

I do not propose to go over the whole field of operative dentistry, including as it does, the operations of extracting, cleansing, pivoting, and filling, but shall confine myself to the consideration mainly of the latter operation. There has been no great improvement in extracting teeth in the last few years of which I am aware, unless the less frequency of the operation may be considered such. The advancement made

in other branches of operative dentistry, rendering this operation less a necessity than formerly—many teeth are now being saved permanently that were formerly removed. In the operation of cleansing, while there has been nothing new in the mode of accomplishing it, there has been an interest awakened upon this subject that betokens good, many practitioners now regarding it as a most important means of preserving the teeth, and of consequence in making the operation much more perfect than in former days. And yet I am persuaded very few operators, if any, ever perform this operation in the most perfect manner. Who ever cleansed and polished a set of teeth in the mouth of a patient, as he has done a single tooth with brush and lathe, or with the hand and such appliances as are in the hands or at the command of all? I affirm that until we so do it, we fall short of our duty as practitioners, and fail to give our patients the full benefit of our knowledge and capability. If this is true, are we not culpable? Do we not implicitly pledge our highest skill, our utmost knowledge to every patient who puts himself under our care, or who takes a seat in our operating chair?

Upon the subject of pivoting teeth, it is needless to dwell between cheap dental substitutes and the advances made in filling roots, and building up crowns; this operation is not nearly so often needed as in years past. And yet there are circumstances under which it is the operation, being the very best artificial tooth that can be worn.

The next subject I would call your attention to is the operation of capping the pulp, and thus attempting to preserve its vitality after exposure.

The most popular and successful treatment is the covering with *os-artificiel*, and then filling it over with gold, after cutting away a sufficient portion of the *os-artificiel* to enable the operator to make a good filling. This mode of practice has been adopted by many, after long years of experiment, in which every conceivable plan has been adopted to quiet this very sensitive, and, after exposure, intractable

organ. Arching with gold foil, capping with gold plate, tin, lead, horn, wood, gutta-percha, asbestos, oiled silk, vulcanite, risodontrophy, etc., etc., have all had their day and trial, running through a series of years. Each one of them has had its advocates, and all has been claimed for the best that we could desire; but alas, they have each failed us at the hour of need, and for the want of higher attainments in knowledge and skill, we have been forced to sacrifice those valuable organs, and thus maim our patients for life. We trust a better and brighter day has dawned upon us, and that henceforth we will by the aid of *os-artificiel*, be able to save where we were compelled to destroy. I can not say to whom the honor belongs of first using this material for this purpose. My attention was first called to it by our President in the summer of 1867. Since that time I have used it with the greatest satisfaction and success, rarely having any untoward effects following its use. It has been used by covering oiled or other silk or linen with it at about the consistency of thin cream, so that it would permeate the cloth, and then placing a small bit of the material thus prepared immediately over the exposed part of pulp, and then proceeding to fill the entire cavity with the *os-artificiel*, and after hardening, removing a portion and filling with gold. Others following the example of our President, cover the exposure with collodion applied with a camel's hair pencil and then fill. I would recommend the following mode of procedure: After thoroughly cleansing and otherwise preparing the cavity, with very delicate drills, I cut small retaining points as near the pulp as my judgement will permit me to approach, remove all foreign matter, wipe out with carbolic acid, dry with cotton or spunk, and put immediately upon the exposed point a small amount of *os-artificiel*, in a very soft state, just sufficiently consistent to enable me to handle it; take up the superabundance of chloride of zinc with tissue paper, and then permit it to set for a few minutes. I then proceed to fill the entire cavity with the same material as stiff as I can use it, over which I flow a little beeswax



protect it from moisture, and let all remain until it sets properly. I prefer, if I can do so, to retain my patient a short time, thirty minutes is often sufficient, then remove a portion of my filling, fill with gold, thus completing the operation at a single sitting. I would not say that this was always advisable, for in some cases the cavity is so shallow and as a consequence the amount of *os-artificiel* to be left is so small, that it is desirable it should get as hard as possible before cutting away any portion, for fear of disturbing or removing that in contact with the pulp.

Such has been my success by this mode of practice, that I think him, who does not try to preserve the vitality of exposed pulps by the use of *os-artificiel*, a sinner above all other men.

Within the last year heavy gold foil has been attracting much more attention than in former times. I believe the credit of its introduction to the profession is due to Prof. Arthur, of Baltimore, some years since, perhaps about the time he first called attention to adhesive fillings. So many startling announcements have been made to the profession within the last few years, often unsettling all our preconceived notions and practice, that I have grown credulous with my years. I have so often been called upon and compelled by the "almighty force of truth," to change to the right about, that I am getting rather used to it. Therefore, when I saw heavy foil so highly recommended, although persuaded that it would not answer, that it would prove a failure in the hands of a vast majority of practitioners, yet I determined to try it, and so compare with my own hands its merit with such as I had previously used. I had not gone as many had to the other extreme by using Nos. 2 and 3, but contented myself with 5 and 6, using mostly non-adhesive foils.

I ordered a few books of Nos. 15 and 20, and the first favorable opportunity took a strip of No. 15 and filled an approximal cavity in my usual mode. I was delighted. I next with the strips proceeded to fill a plain cavity, making



an adhesive filling, using the mallet, and my assistant not made a half dozen strokes, before I felt I had what I had been looking for, for years. When the cavities are at the front of the mouth, I prefer using the strip, because of the facility with which I can control it, and the saving of time in introducing. If the cavities are far back in the mouth, and so more difficult of access, it is best to cut the gold in small pieces, say from one-quarter to one-half inch wide and of various lengths, not exceeding an inch, and to introduce them with pliers, heating each piece in all cases to red heat, in a spirit lamp, before introducing it into the cavity.

Its advantages over light foil are many.

1st. It is softer.

2d. It does not harden so readily under the instrument.

3d. There is less danger of breaking thin walls in using it.

4th. It is more tractable, (if you will allow the phrase) that is, it is more easily handled and controlled with the instruments.

5th. It is much more adhesive; its adhesiveness increases with its thickness. I can not say in the exact ratio of the latter, nor do I pretend to know at what point in the thickness this softness and adhesiveness will attain its maximum, but certainly its adhesiveness increases in the ratio of the increase of its softness, so that when we shall have determined at what thickness gold may be reduced to its softest state, we may, and probably will, have an exact gauge for its thickness for our use.

6th. It finishes up when welded better than any other form of gold.

7th. The working of it gives a confidence to the operator that is of incalculable value, inspiring him with zeal and enthusiasm that tend to fix a high ideal as to what his operations should be when finished. And thus he is led on, excelling himself and approaching perfection, the grand ultimatum of all our efforts. In the filing, cutting and finishing up, it is all the dentist wants.

Now as to the force necessary to consolidate it. It can not, of course, take less than the lower numbers in detail, but it takes less force in the aggregate. It has been stated by some writers in the *Missouri Dental Journal* that higher than 20 could not be used with hand pressure. Yet, I often use No. 30 with hand pressure. It will not chap up when used with proper instruments, nor will the retaining surface be near so easily lost as with the lighter foils, unless from the effects of moisture, so marked in this quality that it will attract the attention of the most casual observer, perhaps the first time he uses. It is much less inclined to double up upon itself when force is applied to it, than thin foil, this is in accordance with a mechanical law easily understood. The question is often asked how heavy should a mallet be to use these heavy numbers? This is an unsettled question, different operators differing widest in their opinions; from one and one half to as high as nine ounces are used. I am inclined in this as in many other matters, to take medium ground and avoid both extremes, and prefer a mallet weighing from two to five ounces, finding the lighter better in some cases, and preferring the heavier in others. If we understood the laws of the physical forces and collisions clearly, we might then determine positively what weight of mallet would be best, leaving out of the fact that it had to be used upon living organs, susceptible of pain. After we have so determined what weight of mallet will best or most perfectly accomplish the work we will have to learn, for this force should be distributed to give our patients the least pain, what weight of mallet and what force will accomplish our ends with the least pain to patients, and disturbance to the surrounding parts. I apprehend that the peculiarities of different cases will modify any rule we may fix upon, and that no positive data can be given for our government, and that we shall have to rely upon our judgment in each case as to how much force it will bear. We are all aware that some persons bear the effects of the mallet with much less suffering than others. The elasticity of the mallet, (the

material of which it is made,) will often very greatly vary our procedure—the one being the most painful in one case, and the other in another.

## SELECTED ARTICLES.

### ARTICLE VI.

#### *Chloral-Hydrate.*

By WILLIAM C. BAKES.

So much has been said and written in regard to the therapeutic and chemical properties of this new reagent, that there may seem but little more to be said in relation to it. We shall, therefore, only mention a few of its characteristics, and suggest the most convenient mode of administering it, with a view of securing its effects as a hypnotic and anæsthetic. Mr. E. Schering, of Berlin, who has manufactured it on a large scale makes the following statement:—Chemically pure chloral-hydrate ( $C_2Cl_3OH$ ) forms white acicular crystals, has a peculiar pungent and a somewhat bitter taste, produces, in concentrated solution, a slight irritation in the throat, fuses and sublimes readily, and keeps well in glass stoppered bottles—even in a dilute solution. In dispensing, glass, porcelain, or silver vessels are to be used.

It is readily soluble in distilled water; only after contact with the atmosphere, traces of hydrochloric acid are discovered, which must be carefully neutralized by ammonia. A dilute solution is to be used for sub-cutaneous injections.

In a pamphlet issued by Dr. O. Liebreich, the following formulæ are given for administering chloral-hydrate:

R.—Hydratis chlorali, 38 grs.;

Aq. distil,

Mucil. acaciæ, aa  $\frac{3}{4}$  ss.—*M.*

S.—Take at one dose. (Ordinary hypnotic.)

R.—Hydratis chlorali, 62 grs.;

Aq. distil,

Syr. aurant., aa  $\frac{3}{4}$  ss.—*M.*

*S.*—A tablespoonful at night. (Ordinary hypnotic.)

*R.*—Hydratis chlorali, 3 ss;

Aq. distil, 3 iv;

Syr. aurant,

Mucil. acaciæ, aa 3 ss.—*M.*

*S.*—A tablespoonful every hour. (Sedative.)

Other formulæ have been used with success, and some physicians have obtained good results from the syrup of chloral.

*R.*—Hydratis chlorali, 160 grs.;

Aq. distil, 3 iv;

Syrupus, 3 iij, 3 ij;

Aq. flor. aurant, 3 ij.—*M.*

*S.*—This may be given in doses of one teaspoonful or more.

A preparation less sweet than the syrup, pleasant to the taste and pleasing to the eye, is found in the elixir of chloral.

*R.*—Hydratis chlorali, 160 grs.

Aq. distil, 3 i;

Syr. aurant, rubr., 3 iij.—*M.*

Chloral-hydrate is also used for sub-cutaneous injections, and may be dissolved in distilled water in suitable proportions.—*Dental Times.*

## ARTICLE VII.

### *The Saving of Time in Dental Operations.*

Read before the American Dental Association, at Nashville.

By PROF. J. S. KNAPP, D. D. S.

There is no vocation which demands the observance of the old adage, "Time is Money," more than the practice of Dental Surgery.

There may be those who say they pursue dentistry from the mere love of it, but none will dispute that far the greater number are engaged in it as men engage in other occupations, in order to earn a support for themselves and families. Only those who are fortunate enough either to have gained or inherited a competence, can afford to talk of practicing their profession for the love of it as a fine art.

We should be thorough in what we undertake to do; slight nothing in the practice of a fine art; but it behooves us to pay especial attention to those plans which are calculated to enable us to perform the greatest good in the shortest time.

If any one present were asked what are the occupations by which the time of dentists is most consumed professionally, he would undoubtedly say that the *construction, tempering and use of instruments, the preparation and use of gold, and the management of patients.*

First, on the *construction of instruments*, I admit that a great variety of these can be found at our dental depots already made; but any dentist who is not able to repair and shape them in accordance with his wants, is in a *worse condition* and is *losing time* every day.

Every dentist, besides being qualified with good judgment to select his instruments for *strength, durability and adaptability* to the purpose for which they are intended, is subjected to great inconvenience in the actual practice of his profession, unless he be able to alter their points, make and tempering them so they can be more readily and actually used in a manner which he understands better than it is possible for him to know who does not *use* them.

This involves a knowledge of *working and tempering steel*, an art which should be pursued in the private laboratory of every practicing dentist, and taught in every dental college.

I have known skillful dentists, and those who were considered to possess profound knowledge in their profession and who had an extensive practice in a large city, to be troubled with the greatest inconvenience from the want of this knowledge, the inability to make and temper their own instruments properly. The best substitute for the lack of this knowledge would be to be a good draughtsman, in order to explain and to a manufacturer the exact form of the article required.

So important do I consider this knowledge to insure success that I advise every young practitioner or student

has not yet been taught the art of working and tempering steel in the laboratory of some dentist or in that of some dental college, to get the information from a practical worker in that metal. When he once knows how to make and temper his own instrument points, he can economize time by preparing them on rainy days, or in hours too early or too late for the usual reception of patients. At any rate the instruments of the dentist should be prepared at such hours as not to interfere with those usually employed in the actual performance of *Dental operations*.

In the use of some of the forms of gold as recommended by certain of our distinguished and able operators, the number of pluggers is large; but in the use of gold in the form of cylinders the necessary number is small, not exceeding ten or twelve for all the pluggers and condensers, thus showing a great saving of time if one uses these instruments and the form of gold for which they are designed.

Excavators, as made by the manufacturers, consist of a variety and number which is too great, and of many shapes which none but a man wanting in judgement would ever attempt to use. This is done by the manufacturer to please the multitude, and probably from the best of motives, but it results in a great loss of time and money. Of course it is well to have as many duplicate points as any individual thinks he will ever have occasion to use; but if ten or twelve excavators be made in accordance with reason, sense and good judgement, an expert operator may properly excavate any cavity to be filled, and in less time, than he who foolishly attempts to use such a great variety of cutting instruments, with each one of which he can accomplish but little. To be plain, no matter what form of gold is to be used, I would discard all the "right and left" (so called) excavators, and many of the forms, five of which are required to make one, and confine myself to the patterns which are but ten or twelve in number. These vary in size and strength, according to the size and location of the cavity in which they are to be used.

Do not deem me dictatorial but allow that I speak from experience, when I say that I should advise all operators use excavator points in plain, strong, octagonal, ivory handles, with round sockets. These instruments will last a careful man his life time, and are of a size to be handled more effectually than the small steel handles, the points of which are continuous with the handles, making the entire instrument useless in a short time. The points can be untempered and remade when shortened by sharpening and can be replaced by others when use and repeated pointings have made them too short. I should recommend that the points be bent at different angles, that some should be but little changed from the line of the handles, others a little more curved, and some bent at a right angle, with the point of connection slightly rounded, and others curved somewhat towards the handle itself, so as to make the "under cut," in cases where it is necessary to form such a cavity.

These excavators are round for half an inch after leaving their sockets, and then gradually squared, to form distinct sides, and flattened in a line right and left of the handle near the points, so that, besides cutting on their very edges they will also cut in two ways on each side, making five cutting edges or angles for each excavator point.

Imagine, then, the execution which can be done with one instrument. With six instruments of this kind, almost any cavity that ever was known may be reached, and thoroughly excavated, and prepared for the reception of gold.

When sufficient space has been obtained to properly approach the approximal surfaces of two teeth, both of which are to be filled, two or at most four excavators are all that are necessary to be used; whereas many operators lose time by scraping and cutting away with a dozen in each cavity, and looking and hunting among a confused quantity of these and other instruments to find the one they want.

After using one well formed excavator in one of these cavities it is a saving of time, without stopping or changing instr-

ments, to turn and use the same cutting point in the opposite place of decay. Such an instrument may cut in the middle and cervical portion of these two cavities, and another, bent at about a right angle with its socket handle, may be made to cut alternately in the opposite half of each cavity, and thus form the "under cutting" in that part which is required. With these two excavators, if properly made and used, the entire orifice of the cavity may also be trimmed, beveled, and smoothed, to aid in giving a fine appearance, finish, and perfection to the plug.

If the cavity to be filled is on the grinding surface of the tooth, with but a small crevice leading to an extensive place of decay, one or two instruments are all that are required to open and enlarge this crevice to a size nearly equal to that of the carious dentine; and two or three excavators are enough, with, perhaps, the aid of one flat head burr and one drill point for the angles, to prepare in a very short time such a cavity for the introduction of the gold.

I am aware that many will tell me that I am talking of executing operations with more simple and fewer instruments than it is practicable to use for such a purpose, and that the rapidity is greater than patients will endure. In regard to the simplicity and small number of instruments which I have represented as capable of such work, any one can prove it by trying them himself, or by seeing others use them.

I have thus spoken of instruments and the rapidity with which they may be used as a general rule, to which, owing to the great variety of cavities, their angles and complications, and the difference in the fortitude of patients and their controllability, there are exceptions.

In the preparation and use of gold there are such widely different views entertained by different operators, that whatever form of this material might be advocated it would be liable to be severely criticised by the advocates and followers of other methods and forms.

I am one of those, who, after having tried gold foil in strips, ropes, and pellets, and sponge or crystal gold (as it is



to be used in its invariably slow process of being packed and gold foil cylinders, have many years since arrived at the conclusion, that in no form can this article be so quickly packed and condensed to a given size and solidity as by the latter method. The cylinders can be prepared before or after office hours, if one is pressed for time, and made of such variety as to be ready to meet the wants of any emergency case, each one that is introduced being of such a bulk to fill far more rapidly than it is possible to do with the row strip or small particles of crystal gold that are used in the welding process.

If any determined, intelligent and skillful operator will give this form of gold a faithful trial he will like it the more he uses it and will be satisfied that, after its introduction, it is capable of being trimmed and receiving a fine finish in less time than is requisite in fillings of other forms of gold. Practice and perseverance in becoming acquainted with the best methods of making and using cylinders will result in such a saving of time and such facility, that saliva pump and rubber dams may be discarded, while such solidification is attained that no patient in the hands of a Dental operator need be subjected to the unpleasant jarring operation of the welding, and no dentist need waste his hours in such a tedious and protracted process, with an assistant to aid him in the operation.

In conducting the affairs of a dental office and the management of patients, there is much to observe by which not merely minutes but hours per day can be saved.

When a Dentist is engaged operating for one who has previously secured the time by appointment, he is liable to many interruptions from a variety of causes. Persons call to make appointments, to pay or collect bills, and some call to have teeth extracted or pain alleviated, and some are in quest of "*cheap dentistry*." There is no necessity that these hindrances should take up one half the time they usually consume, for the use of a few well chosen words will create promptness in others who would not otherwise feel and see

they are occupying time which belongs to others, and prevent them from taking more of it than is actually necessary.

It may be good policy sometimes to allow a patient undergoing a regular sitting to see an extracting operation, if it be not a protracted and difficult one, but never in the latter case should unconnected parties see what may give them a wrong impression, making them blame the dentist, and perhaps discourage them from undergoing a similar operation.

An operator is excusable for leaving his patient a very short time for all necessary interruptions, but not so for engaging in idle talk with those who have nothing to do but pass their own time in a profitless manner and appropriate that which belongs to another. Neither is he excusable for occupying an unreasonable length of time in any operation.

In extracting teeth, firmness of manner and self-possession combined with gentleness and sympathy will generally operate to inspire confidence, and in most cases prevent that desire on the part of the patient, so often manifested, to *delay*, by which many lose so *much time* and *patience* and numerous *patients*.

We should never deceive children in regard to extracting their teeth, or allow parents to tell them in our presence those falsehoods which so affect them afterwards that they are hard to manage, and serv to make them doubt the truth when they hear it.

In preparing sensitive teeth for filling, it is quite possible for one dentist to manage and operate successfully on a patient for whom another dentist can do nothing. The difference is in deportment, voice and words; and he will save most time who exercises these aright, and who can exert the greatest moral force and will-power over his timid and but half reasoning patient.

I regret that, in this age of progress in dental science, there should still live some who think they will save time by placing arsenic in sensitive teeth, in order that they may afterwards more quickly prepare them for filling.

Perhaps one of the most frequent causes of loss of time to the dentist arises from the ignorance or thoughtlessness of patients. They do not always understand that while they are brushing or rinsing their mouths, they are occupying far more time than is necessary, and that their hour is fast gliding by. That another patient has a right by appointment to the succeeding hour. It is best to state the facts, and to use a reminder that the time is passing. Better be occupied with actual operations rather than in profitless talk.

Much time may also be saved if the operator will hold the tumbler to the mouth of his patient only as often as he deems it necessary, instead of allowing the patient to handle the glass and rinse *ad libitum*. Young and timid operators frequently lose much time by failing to put their patient in the most convenient position for them to accomplish what is to be done. Time wasted by the patient holding his head over the spittoon may easily be shortened by a gentle touch on the shoulder, when the head goes at once back to its place.

Let us follow these simple directions, and do no cheap quackery (so called), and make patients pay for the hour they consume, and much more time and money may be saved.  
*Dental Register.*

## ARTICLE VIII.

### *Immobility of the Jaws.*

*Clinic of Prof. Briggs, St. Vincent Hospital.*

James D——, aged 21 years, has come to us from Madison County, Tennessee, for relief of an immobility of his lower jaw, the result of mercury given during an attack of typhoid pneumonia, when he was eight years old. The inflammation resulting from the action of the mercury was violent, terminating in extensive sloughing, and ulceration of the tissues on the left side of the face, not, however, involving the skin. When the parts healed, the lower jaw was rendered perfectly immovable, and has continued so ever since.

You will observe that the left side of the face is flattened ; that it is hard to the touch, but is free from cicatrices. When separating the lips, you see that by his efforts, not the slightest motion of the jaw can be effected ; that the upper teeth (more like tusks) are long, and project over the lower ; that, on the right side of his lower jaw, two teeth have been extracted, and through this opening he introduces his food and drink.

Upon examination, I find that all the tissues, from the angle of the mouth backwards, are in a state of inodular cicatrization, and firmly adherent to both the upper and lower jaw. I think, but am not perfectly certain, that there is a slight lateral motion of the jaw.

The patient is in a very unpleasant condition, especially for unlocking his jaw ; but such operations are not always successful. Sometimes we fail to unloose the jaw at all, but more frequently, after it is separated, it becomes closed again, by the gradual contraction of the inodular cicatrices in the healing process.

I will now divide, within the mouth, all the adhesions between the cheeks and jaws, freely. It may be necessary, at the same time, to divide the masseter muscle and, if I should encounter any osseous plates, I will endeavor to sever them ; after which, by means of the screw lever first referred to by Scultetus, and afterwards introduced to the profession by our distinguished countryman, Professor Valentine Mott, I will force the jaws asunder if possible. Either the instrument mentioned, or little wedges of wood, should then be kept in the mouth, day and night, and pieces of slippery-elm bark interposed between the cheeks and the jaws, to prevent them from adhering. I am prepared for obstinate resistance in this case.

(Free incisions were then made through the adhesions, in which was a plate of bone extending from the coronoid process to the upper jaw. This was divided with the bone forceps, and a portion removed, and the screw lever applied ; but it was not until the second one had been added, and

great force used, that the parts were separated. The were then kept asunder by the instruments, for three weeks at the end of which time the patient had regained the complete functions of the jaws, and went home, with instructions to keep the wedges in the mouth for a month or two. *Nashville Journal of Medicine and Surgery.*

## MONTHLY SUMMARY.

*Bad Effects of Chloral.*—A patient in Guy's Hospital, aneurism of the thoracic aorta, being given half a drachm of chloral to allay pain and procure sleep, became unconscious immediately on the administration of the dose, with lividity, coldness of face and hands, and respiration only at long intervals, death seeming imminent for five hours. These symptoms passed off during the following day. In commenting on the case, Dr. Habershon remarked that it confirmed the opinion he had formed from observation of cases of pneumonia and bronchitis; namely, that chloral tends to cause bronchial and pulmonary congestion, through its action on the pneumogastric nerve, it should not be given where embarrassment to respiration is liable to occur.

Dr. R. C. Shettle, Physician to the Royal Berkshire Hospital, in the course of an address before the Pathological Society of Reading, after referring to Dr. Richardson's statement that under the influence of chloral formiate of soda is formed, and the coagulating power of the blood is much diminished, adds that "it is very evident that not only is passive hæmorrhage from an open vessel favored by the administration of chloral, but from the tendency which exists from the continuous administration of the drug to produce decomposition of blood, a small loss of blood would be very possibly followed by serious symptoms. Moreover, it can scarcely be a question whether the tolerance of the drug is much greater in some individuals than in others; and possibly the same person at different times might bear its administration very differently." If these be correct, much caution would seem to be called for in the use of chloral in midwifery cases.—*Medical Gazette.*

*Treatment of Chilblains*—For these exceedingly obstinate and troublesome affections, the *Medical Press and Circular* recommends the following formula:—Liniment of belladonna, two drachms; liniment of aconite, one drachm; carbolic acid, ten drops; collodion flexile, one ounce; to be applied with a camel's hair brush. If the chilblains vesicate, ulcerate, or slough, the aconite should be omitted.

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*Vaccination in the Negro*.—Dr. Mortimer, an English Naval Surgeon, states, as the result of his experience in a number of cases, that the vaccine vesicle in the negro, does not develop until from the eleventh to the thirteenth day. Will some of our Southern readers inform us if they have noticed the same phenomenon; and also if admixture of white blood have any modifying influence?—*Medical Gazette*.

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*Death from Chloroform*.—Dr. E. C. HAMILTON of Washington, Ohio, writes to the "Dental Register" as follows:

"Mrs. Garris, the wife of our county sheriff, came to my office on Thursday afternoon for the purpose of having three roots and one molar tooth extracted. Dr. I. G. Wilson, a physician of this place, was with her, to administer chloroform. After I examined the mouth, and laid out the necessary forceps for the operation, Dr. Wilson proceeded with the chloroform, and after administering probably ten minutes (he did not intend to put her entirely under its influence), he called to me to take out one tooth. I then extracted the root of the right superior lateral incisor, only about one-fourth of an inch in length, and attended with no difficulty whatever. The patient then asked for more chloroform, and the Doctor was on the point of giving it, when death ensued. Three physicians worked probably three hours to restore life, but all in vain.

"These are the facts of the case." Three of our medical gentlemen, who use chloroform extensively, attempted to charge upon 'the shock of extraction' the cause of death, but the people so ridiculed the idea that they abandoned it. Of course all who are acquainted with the facts attach no blame or responsibility upon me, as it is well known that I have invariably refused to use chloroform, and have advised in every case against its use in dental surgery.

"I make this statement to you so that you may know the facts are, and not be misled by newspaper statements in case you desire to refer to the case in your journal.

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*Influence of the Pancreas on Fat.*—According to Dr. D. "the influence exerted by the pancreas upon fats appears breaking up the aggregation of the crystals of the fat, alters its hydration. It alters the molecular condition of the fat mingling it with water in such a way that ether cannot separate the fat from the water. A permanent emulsion is thus formed ready to mix with a larger quantity of water whenever it may be added. The pancreas, therefore acting upon fat, does not decompose it into fatty acid and glycerine; the absence of glycerine from the watery stratum and the presence of the glycerine in the pancreatized fat of the ether stratum having been demonstrated. It is well known that in addition to the influence of the pancreas upon fat, it has the power of converting starch into glycose by simple mixture. This property remains to a certain extent after the pancreas has exhausted its property of acting upon fat. The quantity of pancreas that before mixture with fat will convert about eight parts of starch into glycose, after saturation with fat will still convert about two parts of starch into glycose.—*Proceedings of the Royal Society.*

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*Manufacture of Ozone.*—Mr. Loew, of New York, has discovered that ozone is formed in rapid combustion. The German chemist Carl Thaur, finds the observations of Mr. Loew to be correct.

A small quantity of ozone is always found in that part of the air which is immediately in contact with the lower part of a hydrogen flame, and its presence can be shown by drawing the air through a glass tube. The point of the tube ought to be inserted into the lower half of the flame, and the draft must be strong enough to divert the flame a little from the perpendicular but not enough to draw the unconsumed gases through the tube; they at once destroy the ozone. Burning charcoal yields no ozone, for the reason that the carbon absorbs both atoms of oxygen to produce carbonic acid. This method of the formation of ozone is of great interest, and may eventually lead

practical application in bleaching and disinfecting. It would appear to be a cheaper and a better way to evolve the active oxygen than by electricity.—*Medical and Surgical Reporter*.

*Theory of Sleep*.—Dr. E. Sommer, in *Zeitschrift fur Rationelle Medicin*, declares that sleep is the result of a *deoxygenation* of the organism. "The blood and the tissues possess the property of storing up the oxygen inhaled, and then supplying it in proportion to the requirements of economy. When this state of oxygen is exhausted, or even becomes too small, it no longer suffices to sustain the vital activity of the organs, the brain, nervous system, muscles, &c., and the body falls into that particular state which we call sleep. During the continuance of this deep repose, fresh quantities of oxygen are being stored up in the blood, to act as a supply to the awakened vital powers. Rest produces, though in a less degree, the same effect as sleep in reducing the expenditure of oxygen."—*National Med. Journal*.

*The Physiological Effect of Muscular Exercise*.—In some remarks on this subject recently made before a medical society in New York, Dr. Austin Flint, Jr., stated that there is an increased quantity of excrementitious matter produced in the system on violent muscular exertion.

Some recent experiments seem to throw doubt on this statement, but he thought their results were not correct.

Within physiological limits, the elimination of this excess of effete matter is attended, if proper nutriment be supplied, by increased nutrition. If a man in health, eating and drinking according to a correct appetite, exercises his muscular system so as to increase to its highest point the elimination of effete matter, he will correspondingly increase the nutrition of his muscular system. If we can thus develop the muscular system the rest of the body will share in the improvement.

Can a man by such exercise successfully combat the tendency to deposits in his tissues, to the formation of tubercles?

Dr. F. thought such was possible; he had seen consumptives, with tubercles already formed, go to the gymnasium and become hale and robust. He knew one case in particular where the patient became an accomplished gymnast after tubercles had



been clearly diagnosed in his lungs. It would seem that the men might by increasing the deposit of normal material, have removed the disposition to the deposit of that which is abnormal.

Let a man moderately healthy work as hard as he pleases with his brain—if only he take the appropriate exercise to keep the system throwing off the effete matter, and appropriating its place, healthy nitrogenized functioning matter, he will be comparatively safe.

It is better by constant exercise to keep ourselves healthy than to break down every few months and have to take a vacation to recruit again.—*N. Y. Medical Journal.*

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*A New Antiseptic.*—The hydrate chloride of aluminium which Mr. John Gambee has recently drawn the attention of medical men and the general public, appears to be a valuable antiseptic. It is quite as potent as chloride of zinc or carbolic acid, and is at the same time non-poisonous, and devoid of the unpleasant smell of every kind. These qualities will no doubt insure its being extensively used, and at no distant date we expect it to displace the antiseptics which are at present in vogue.

It is somewhat strange that this substance should have been so long overlooked as a possible antiseptic, and Mr. Gambee certainly deserves credit for suggesting the utilization of it for this purpose. The reason why it has been passed over is probably to be sought in its not being a waste product in any commercial chemical manufacture. The anhydrous chloride of aluminium which is manufactured in order to serve for the preparation of metallic aluminium, is far too costly on account of the troublesome nature of the process by which it is prepared—to wit, passing chlorine at high temperatures over a mixture of aluminium and charcoal. By placing the anhydrous chloride of aluminium in water, it is of course converted into hydrate chloride.

The most economical process for the preparation of the hydrated chloride of aluminium appears to be by double decomposition between sulphate of alumina and chloride of calcium (both of which are cheap commercial products). When solutions of these two salts are mixed together, sulphate of lime

formed and appears as a precipitate, whilst the hydrated chloride of aluminium remains dissolved.

On allowing the aqueous solution to evaporate at a very gentle heat and afterwards cooling, crystals of hydrated chloride are produced. If an attempt be made to drive off the water from the hydrated chloride by the application of heat, decomposition will take place. Hydrochloric acid is evolved under these conditions, and oxychloride of aluminum is formed, and, by pushing the process, alumina is obtained as the ultimate fixed product.—*Lancet*.

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## BIBLIOGRAPHICAL NOTICES.

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*Pathologie Der Zahne, Mit Besonderer Rucksicht Auf Anatomie Und Physiologie. Bearbeitet Von Prof. Dr. C. Wedl. Leipzig Verlag Von Arthur Felix.*

This valuable work of three hundred and sixty-two pages and one hundred and two well executed wood engravings, has been received, and we find that it contains much valuable information concerning the dental structures.

We trust it may soon be translated into English, so as to place it within the reach of all interested in the subject.

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*Twelfth Annual Report of the Chicago Eye and Ear Infirmary.* Presented by the Board of Surgeons for the year 1869.

The total number of cases of diseases of the eye treated during the year was 759, and of diseases of the ear 114.

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*Scientific American.*—Twenty sixth year. This splendid weekly, greatly enlarged and improved, is one of the most useful and interesting journals published. Every number is beautifully printed on fine paper, and elegantly illustrated with original engravings, representing new inventions novelties in mechanics, manufactures, chemistry, photography, architecture, agriculture, engineering science and art.

Farmers, mechanics, inventors, engineers, chemists, manufacturers, and people of all professions and trades will find the *Scientific American* of great value and interest.

Its practical suggestions will save hundreds of dollars to every household, workshop, and factory in the land, besides affording a continual source of valuable instruction. The editors are assisted by many of the ablest American and European writers, and having access to all the leading scientific and mechanical journals of the world, the columns of the *Scientific American* are constantly enriched with the choicest information.

An official list of all the patents issued is published weekly. The yearly numbers of the Scientific American make two splendid volumes of nearly one thousand pages, equivalent in size to four thousand ordinary book pages. Specimen copies sent free. Terms—\$3 a year; \$1.50 half year; clubs of ten copies for \$25.00, with a splendid premium to the person who forms the club, consisting of a copy of the celebrated steel plate engraving, "Men of Progress." Published by MUNN & CO., 37 Park Row, N. Y.

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*The Manufacturer and Builder.*—Published by Western Publishing Co., Park Row, N. Y. is one of the most useful and attractive of this class of magazines, and is profusely illustrated with designs and drawings of machinery etc. etc. Much useful reading matter is found in every number, which will prove interesting to all professions and trades. Terms \$1.50 a year.

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*The Herald of Health.*—Published monthly by Wood & Lothrop, 13 and 15 Lighthouse St. N. Y. Terms \$2, a year.

Of this publication the "Scientific American" remarks "it is a journal which contains more sensible articles on subjects of practical moral bearing, than are to be found in any other monthly that comes to our sanctum." Its articles are the production of sound thinkers and able writers, and render it a work of great value.

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*Arthur's Lady's Home Magazine.*—The January number reached us, filled, as usual, with interesting matter, and cannot be excelled by any competitor of its class. The colored fashion plate is one of the finest; the rich Cartoon entitled "Skein Winders" is a picture of high artistic beauty. "Grand Darling," "Going to School," and "Coming from School," three charming pictures. In elegance and beauty and attractive reading, this Magazine will always prove interesting to patients in a dental office, as well as in the home circle. Published by T. S. Arthur & Sons, Philadelphia, Pa. Terms \$5 a year. Three copies for \$5.

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*The Children's Hour,* with its wealth of sweet pictures and attractive reading matter, cannot fail to be a welcome guest to all the little ones of a household. Its pure and benign influence will be appreciated by every parent who supplies his child with it. Published by T. S. Arthur & Sons, Philadelphia. Terms \$1.25 a year.

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*The Bright Side* is the title of an interesting child's paper, eight pages, which is published weekly and semi-monthly. It contains serial and short stories, poetry, topics of the times.

news, scientific articles, biographical sketches, historical articles, stories of travel and adventure, bright side sermons and illustrations appropriate to the text and the times. The semi-monthly edition is intended especially for Sunday Schools. Address Bright Side Company, Chicago Ill. Terms \$1.00 a year for the weekly edition.

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*The American Agriculturist*, for the Farm, Garden and Household. Orange Judd & Co., 545 Broadway, N. Y. Terms \$1.50 a year. This standard work has now reached its thirtieth volume, and is so well known, that it requires no words of ours to enlighten the public concerning its merits. We can but wonder how its Publishers can supply so elegant a magazine for the subscription price, as every number is profusely illustrated, printed on fine paper and presents a very attractive appearance. It has become a welcome guest to every farm house where it is received, as it contains matter interesting to the young as well as to the old.

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*Scribner's Monthly*.—Scribner & Co., 654 Broadway, N. Y. Conducted by L. G. Holland. Terms \$3 a year. The January number of this popular illustrated monthly magazine has been received, and the following is the table of contents: Fairmount Park, illustrated. Kings of the Air, illustrated. The Goblins of the Ice, illustrated. Tartini's Dream Music. The Christmas Door, illustrated. Mirabel's Christmas. Natasqua. Lucky Peer, illustrated. Terms of Peace. How we escaped war with Spain. Ships, illustrated. The Flight of the birds. The Northern Lights, illustrated. Strasburg after the Surrender, illustrated. Wilfrid Cumbermede, illustrated. My Wild Sis. A Christmas Eve in Germany. Topics of the Times. The Old Cabinet. Home and Society. Books and Authors at Home. Etchings, etc. Christmas Carol, making it an attractive and interesting work. The articles are from the pens of some of the best authors of our times.

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*The New York Observer Year Book and Almanac*, 1871.—This valuable work has been received and contains useful information on almost every subject. It is divided into Astronomical, Civil and Commercial, Ecclesiastical, Church Work, Educational, Agricultural and Miscellaneous Departments. Price \$1.00. All subscribers to the *New York Observer* will receive this work gratuitously, upon paying their subscriptions for one year, in advance.

The first Directory of New York, published in 1786, is reprinted entire in this work. It is a very rare book, and four years ago a copy of it brought \$100 at public auction.

*The Art Review.*—A Record of Art-Progress in Art. E. H. Trafton, Publisher, 39 Park Row, N. Y., and 115 Madison St., Chicago. The January number contains the following illustrations: Under the Daisies, a full page etching, by Williams. Chicago Statuary. Chicago Academy of Art Building. A Hint to Artists, Comic Cartoon, by F. S. C. Poems and Prose, and other interesting art-matter. The Review is a bi-monthly. Terms \$1.50 a year.

## EDITORIAL DEPARTMENT.

*Dental Items.*—We have received from Dr. J. T. Love, of Dr. Jno. C. Storey, of Eutaw Ala., for the Museum of the Baltimore College of Dental Surgery, one of the finest specimens of osseous union of the teeth, which we have yet seen. It consists of two inferior incisors joined by complete union of both crowns and roots—from the cutting edges to the extremities of the roots. Also another valuable specimen of the same malformation received from Dr. Wm. J. Fogle of Columbus, Ga., which consists of two lateral incisors, the superior second and third, joined by an osseous union of their roots. The roots of both teeth are enlarged—enlarged by a deposit of osseous matter resembling enamel in color and density much more than cementum.

Dr. Jno. C. Storey writes that he now uses, at the suggestion of Dr. R. E. Watkins, of Eutaw, Ala. lead packing for vulcanizing and prefers it to rubber packing.

Dr. Webster in the "Canada Journal of Dental Science" gives the following directions for drying cavities preparatory to introducing the material composing the filling: "In order to dry out a cavity, I use cotton wool and then dip a pledget of cotton in alcohol and wipe out the cavity with it, and it evaporates leaving the cavity as dry as spunk." "Chloroform has also been used for the same purpose."

Dr. Carroll in the "Medical Gazette" states: that "in September, 1868, Dr. Perrine, of this city, afforded me an opportunity of trying the spray apparatus upon a patient of his, who had I think sixteen teeth and fangs, upper and lower, extracted without pain under its influence. (Vide *Medical Gazette* September 19, 1868, p. 397). The use of the spray for the first four minutes sufficed to deaden sensation long enough for the extraction of all the teeth on the anæsthetized side, and long enough for the completion of the painful portion of the operation of vibrating a sensitive tooth. In patients with much adipose tissue over the ganglion, the effect is less rapid and less profound, but even where sensation is not destroyed it is very much lessened. I write this to give a hint which I should be glad to see others follow."

learn has led to satisfactory results among your sensitive patients.

In the same journal the following directions are given for preserving instruments from rust: If polished instruments are rubbed with pulverized casistic lime, or dipped in lime milk, they do not rust. The lime is easily removed when the instrument is required for use."

Dr. A. Berry, in the "Dental Register" recommends "cones of pumice stone" for polishing rubber plates, the cone being kept wet and used immediately after the steel bur or scraper, and followed by pulverized pumice, or cork or leather cones, and lastly by a brush and whiting. The cone of pumice is made by sawing from the firm stone, in the direction of the grain, pieces an inch or more in diameter and two or more long. A tapering hole is made in one end, into which is fitted by liquid silix or other cements, a piece of wood by which the cone is attached to the lathe. After cutting off the angles the piece of pumice-stone is shaped into the form of a cone by holding firmly against it a large piece of the same stone and revolving rapidly.

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*How to Walk and Stand.*—We have the following account of a lecture on this subject, by Prof. Burt G. Wilder, of Cornell University. The very position of the head upon the spinal column of mankind gives to him, and him alone, power to elevate his eyes, and which man would not be endowed with did he move forward and backward upon all fours. We have the power of grasping with the hands, and of touching every part of the body with the fingers of one and the other hand, which typifies and represents in the bodies that freedom of will which man possesses beyond all other animals: and, finally, we walk erect, and there must be certainly something in this beyond the mere fact that man's body is balanced upon two feet and stands erect. The tallest apes are obliged to walk upon their feet, as we should walk upon the hands with the great toe standing out from the side of the foot, and the heel is so that it has not the power of supporting the body that our heel has. The great toe is the essential part of the foot in standing or walking. Man is at once placed at a disadvantage when you place him on all fours and make him walk like an ape.

The lecturer then drew a man in that position and said: The head now hangs forward as a great weight, requiring muscles which we do not possess to support it. The curve in the back and the limbs are so arranged that the knee itself touches the ground, our thighs being much longer than the corresponding bones in the upper arm; and we have to raise the thighs so that the feet may touch the ground.

The Professor dwelt upon the effect of walking upon a man's stature, and then exhibited a gradigraph, a simple apparatus,



consisting of two hollow tin tubes placed so as to form a right angle triangle, each tube containing a wooden piston resting on a spring and having attached to the outer end a piece of charcoal. By means of this instrument he showed the variation in height of a person while walking, and also the oscillation of the body from side to side. "I do not," said he "claim for this instrument wonderful powers, but it is, I think, possible by this means to get a more exact idea of the gaits of different nations. It will certainly be easy to recognise a gait having any distinct characteristics, as, for instance, a stage stride. We know that the French walk different from the Prussians, and the Prussians from the English.—It is possible that this instrument may be perfected so as to measure the exact amount of oscillation up and down and downward and from side to side. One very curious fact in regard to walking is that one side of the body always tends to outwalk the other side. It is not possible, when the eyes are shut, to walk in a straight line for any length of time.

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*The Coating of the Tongue.*—Dr. J. M. DaCosta, in *Medical Diagnosis*, notes the following variations of the coating of the tongue: "In health the tongue has hardly a discernible coating. Disease quickly gives it one. In inflammation of the respiratory tract, at the commencement of fevers, in disorders of the portions of the abdominal mucous tract, the epithelium acquires a loaded, whitish appearance. The tongue coat is apt to be yellowish in disturbances of the liver, and to be brown or very dark hue when the blood is contaminated. In all cases we must be very sure, in drawing our inferences, that the color of the tongue is not due to the food partaken of, or to medicinal agents. Its color is also modified by the character of the occupation. Thus, as Chambers asserts, there is a curious smooth, orange tinted coating on the tongue of tea tasters. A local cause, such as decayed teeth, sometimes gives rise to a thick opaque coat. For instance, decayed teeth may produce a yellow sheathing on one side. Affections of the fauces also occasion a deep yellow hue. Again, some persons, even in health, wake up every morning with their tongue covered at the back with a heavy coating, which wears off during the day."

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*Obituary.*—Dr. Brewster, formerly Court Dentist of France and Russia, recently died in Versailles, after a residence of thirty seven years in Europe. He was appointed court dentist by Louis Philippe, and received numerous decorations from crowned heads of the continent, and enjoyed quite a reputation as a skillful operator.

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DENTAL SCIENCE.

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Vol. VII. THIRD SERIES--FEBRUARY, 1871. No. 10.

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ARTICLE I.

*Microscopy of a Tooth. Osteo Dentine. Case No. 2.*

By S. P. CUTLER, M. D., D. D. S.

A second lower molar tooth standing alone, of a young man 26 years old, and of a nervous, temperament, was extracted except the anterior fang which was left in the jaw. This tooth was decayed on the posterior approximal side, the cavity extending to the grinding surface, and reaching the nerve cavity, which had an ossified pulp nearly complete except over the broken fang, which was narrowed but had a live branch of nerve; the main portion of cavity was completely ossified, the ossified pulp being perfectly white like the other dentine—this posterior fang was completely ossified to the apex. The ossification must have taken place before the decay quite reached the pulp cavity, from the fact that it had extended into the secondary dentine to a limited extent, which was of a brown color darkened by the use of tobacco. The process must have first commenced just under the point of decay, and extended across and downwards into the fang, it being confined mainly to the pulp, as the narrowing of the pulp chamber was limited, the ossified pulp filling it completely, the line of demarcation being beautifully defined. What is most remarkable in this speci-



men is the bone corpuscles or cells, genuine lacunae and canaliculi, in the fang portion as complete as in the crown, though not occupying the entire dentine, only around the outer layer of cells of the pulp, the inner portion presenting the usual appearance of secondary dentine under the microscope, only not so regular owing to a hurried condition of process resulting, in some portions, of almost complete interruption of nerve fibrils and what should have been secondary tubuli. In some regions, especially around the border of the pulp, were very large and extensive *lakes or lacunae* large enough for a good sized microscopic whale to bask in perfect freedom. These were in connection with the bone cells also in the crown portion.

This is the second case of true bone corpuscles that I have seen with in secondary dentine, and the first in a permanent section from hundreds of specimens. How many times others have witnessed them I am unable to say, as they have not been published to my recollection. The bare report of other cases amounts to but little unaccompanied by theoretical hypothesis; whether true or false they are better than none at all. My views of such cases are these: That when a tooth decays so as to remove a considerable portion of dentine there is necessarily removed a corresponding amount of vital resistance in the pulp immediately under the removed, as the nerve fibrils so removed connect directly with the brain. Now in order that normal circulation should be kept up in any part there must be a normal amount of neural stimulus always in such part, otherwise stasis in the capillaries takes place and consequent infiltration into surrounding tissues of liquor sanguinis to a greater or less extent. In the case of a decayed tooth if there is no actual uneasiness felt in the tooth at all, it is beyond any doubt a weakened condition of pulp resistance, and in a corresponding manner the blood in the pulp in part or all, circulates more languidly, thereby allowing more time for entrance of liquor sanguinis and consequent lime salts into pulp substance, which gradually hardens

the form of minute granules forming nuclei for further accumulation of lime salts, which may be regarded as the origin of the process, the pulp substance being a favorable matrix for ossification when nerve resistance has been overcome more or less, and the process being governed *paripassu*, by resistance or non-resistance. When the destruction of dentine has been considerable, and much irritation exists, the process may be hurried, as in the above named case, to such an extent that neural resistance is *nil*, when true bone corpuscles are formed on the same plan or principle of secondary bone formation, in cases of fractures or other injuries of bone, as the bone matrix is always of very low vitality, and vital resistance, otherwise ossification, could not take place under any circumstances.

There is a law in bone formation as yet very imperfectly understood, we can simply recognise the process and not much more.

It would seem that there is a normal balance in the proportion of the animal and mineral constituents of teeth, favorable to normal healthy action and reaction, resisting for a long series of years any undue encroachments of the mineral elements upon the more vital, when unaffected by disease or decay. Any injury done to teeth, such as undue jarring by biting hard substances, absorption of alveolus, loosening from salivation or any other cause, undue collection of tartar around the teeth, and even constitutional disturbances, one and all may contribute to these secondary processes in an undue or abnormal manner. Wearing away by mastication, by the use of tobacco, and when other teeth are wanting to masticate upon, by longevity, one and all of the above cited cases tend to the same end or result, differing only in degree and time.

In that of longevity, where there has been no undue service, only normal mastication of food, there is simply a narrowing of tubular canals and pulp chamber, by deposit on inner walls, by regular integration of lime salts, preceded no doubt by colloid matter to hold the salts until the entire

interior of the tooth is more or less completely occluded its vitality ebbs *paripassu* with the integrating process. The modern "batter-whanging" on teeth with the mallet or over forcible hand-pressure in filling, tend to favor ossifications as much more frequently met now than twenty years ago. There are certain temperaments, such as the nervous, more prone to secondary ossific formations, others, such as the bilious, which has more resisting force. The lymphatico-nervous might be regarded as the most susceptible, while the bilio-sanguine is the most resistant, the mixed temperaments. When an aching tooth presents itself we are not always sure that there is ossification existing, especially when the sensibility will not allow of careful examination before making applications to destroy the pulp; prior examination will not always reveal the condition. In cases of spicular nodules in the pulp, we cannot determine the fact before removal of the pulp, though in such cases where the deposit is not extensive there is no great difficulty in the removal of such nerve by the branch of the nerve where there is sufficient opening of nerve cavity they may be destroyed by arsenic. In the above cited case we have two kinds of corpuscles or cells in certain regions, secondary dentine, others, showing nerve plexuses and tubuli, in other regions extensive caverns, others again uniform homogeneous structure, where all traces of organic tissue structure are obliterated, clearly indicating the hurried condition of the process. When bone corpuscles prevail, we necessarily conclude that all vital resistance has succumbed to the ravages of metamorphosis; in other regions nerve resistance determined the process and resulted in secondary dentine. I have recently met with ossified pulp in deciduous teeth, where the process of absorption had been perfectly normal in all respects. I have a specimen of molar showing true secondary dentine where absorption had extended into the pulp chamber in the way of crown, others more or less absorbed away by the process, unaffected by decay in some instances, others decayed more or less. All such cases when carefully studied

tend to shed light on our limited stock of histo-pathological knowledge, which I am sorry to say is sadly neglected by our profession. The practical issue of the case is, whether or not there can be any means desired by which ossification can be made to take place under the region of extensive decay, so as to protect the pulp in that direction from the shocks of fillings of any description, differing somewhat among themselves, which are either favorable to this process or to the death of pulp, as the pulp cannot long remain *status-quo* in such cases. Even if nodular dentine should be the result, unless the process should be too much hurried, the same conservative end will be accomplished and more or less of the pulp remain vital, sufficient to save the tooth from *articulo mortis*. The question is how shall we treat and manage teeth in order to accomplish this desirable end. Duty is knocking loudly at our doors for response, we owe this debt to humanity, to ourselves and the rest of mankind.

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## ARTICLE II.

### *Report on Operative Dentistry.*

Read before the American Dental Association.

By GEO. H. CUSHING, D. D. S.

A report upon operative dentistry should naturally present all that has been done in this department since the last full report was made, whether in the matter of improvements, or changes both as to methods of practice and materials used and instruments and appliances introduced, tending either to simplify operations or to render them more nearly perfect.

The endeavor will be made in this report to do this as briefly as is consistent with the importance of the points to be considered. But it must not be inferred that the report lays claim to perfection, either in regard to the introduction of every modification in practice or to the manner of treatment of the subjects considered.

While it is possible that it may treat of some things which are unimportant, it is very probable that some things will

not appear that should have a place in it, from the want of information or forgetfulness of the committee.

The subject of operative dentistry is one of such importance that reports upon it might naturally be expected to be found occupying a prominent place in the transactions of this association, but a search of the records would certainly not convey to the investigator the idea that it was of great importance, as only two reports upon it are to be found in the organization of the association, and neither of them could in any sense be said to fully cover the ground which such a report should cover.

It has been deemed proper to make this report, if possible, a compendium of the main features which have marked the progress of operative dentistry since the formation of this association, and for the reason, that while much has been done and many of the improvements during that time have been fully discussed and written up in our various societies and journals, yet there is no room as such among the transactions of the association covering all the ground. The propriety of having such a report among our transactions must plead the excuse, if such is needed, for referring to points generally understood, or which have been previously written upon.

It would seem proper, for the purpose of securing greater completeness of this report, to speak first of the use of cohesive foil for the purposes of operative dentistry, on account of its being the first subject in the order of time because since the time of its introduction it may be claimed that the most marked advances in operative dentistry (as applied to the preservation and filling of teeth) have been made which the profession has ever known.

Since the introduction of cohesive foil to the attention of the profession by Dr. Arthur, some fifteen years since, it has steadily been growing in favor with practitioners generally, and it may now be said that the method of filling teeth with cohesive foil has been generally adopted.

That this method is more in accordance with philo-

ical principles than any other, would seem to be a fact easily to be established. In the use of soft foil exclusively, the principle of wedging must be depended upon entirely for the security of the filling, and in order to make a dense and thorough operation, great wedging force must necessarily be used. Great judgement is requisite to determine the amount of such force a tooth will safely bear, while in some cases the frailty of the walls is so great that any amount of such force necessary to properly secure a filling would seem likely to prove fatal to the integrity of the tooth. The least amount of such force requisite to properly pack, secure and thoroughly condense a filling that can be applied to a tooth must be acknowledged to tend to some extent to its disintegration and to fracture; and inasmuch as more force is generally used than is absolutely necessary, the certainty of weakening the tooth and the danger of accident from fracture render the objections to the wedging process quite serious. All practitioners probably have seen numerous instances in support of this position where teeth had been fractured and injured by this wedging force.

In the process of filling teeth with cohesive foil, the principle involved is entirely different. The filling should depend mainly upon secure anchorages, made by means of retaining pits, formed at the base of the cavity and elsewhere where the dentine is firm and strong. From this base or anchorage the structure of the filling proceeds with almost the entire force necessary to the condensing of the gold, directed in the line of the longitudinal axis of the tooth and root, the lateral force necessary to be used as compared with the wedging force when that method is followed, being very slight indeed. This method must clearly occasion less disturbance of the structure of the tooth, less liability to accident from fracture during the operation, and less weakening of the tooth from lateral pressure upon the walls, while the filling may be more thoroughly secured and more densely compacted than by the wedging process. It would seem clearly true that this is the more scientific of the two



methods, where either might be used. But there are in which the wedging process could not be used, as where it is impossible to so shape a cavity that it shall present one or more opposing walls nearly or quite parallel to each other or where the walls are so thin as to render sufficient wedging force impossible or highly dangerous, or in building up beyond the margin of the cavity. In such cases the use of cohesive foil enables the fulfillment of the requirements of the case as nothing else could do. It renders possible the performance of operations which otherwise could never have been performed, and secures the preservation of a valuable class of teeth, which otherwise would of necessity fall prematurely a prey to the forceps.

The introduction of cohesive foil, then must be regarded as a decided improvement, and the influence which this innovation has exercised in developing all the improvements in practice which have marked the period since it occurred can hardly be realized. It is not intended by these remarks to ignore the various forms of sponge or crystal gold. They will be referred to in their proper place. But the reason proceeds upon the basis that cohesive foil better fulfills the conditions demanded generally of a material for filling teeth than any preparation of gold.

A marked advance is clearly perceptible in the last few years in the matter of thoroughness in the preparation of cavities.

The more careful preparation of the margins of cavities and the more complete removal of affected and impure tooth substance, whether absolutely broken down or not, has evidently received far more attention than formerly. The necessity for cutting out fissures and making compound cavities where there are several simple ones in the tooth, with but slight sound structure intervening, is becoming daily more evident to the profession, and the advantages arising from this advanced mode of practice are becoming more and more established in the minds of careful observers.

The great principle of physiology and pathology, an intelligent application of which is so essential to successful operations in the mouth as well as elsewhere, are generally better understood, and influence the intelligent practitioner of to-day in all his operations to a greater or more satisfactory extent than ever before, adding to his success in just the ratio in which his familiar acquaintance with these principles approaches thorough understanding of the ultimate truth.

These causes above noted combined have tended to give an impetus to conservative dentistry in the broadest sense of that term, which is truly gratifying and gives the highest promise for the future.

Under this impetus renewed efforts have been made to develop a safe and satisfactory practice for the preservation of the life of the pulp in cases where it has become nearly or quite exposed. In this report it is only proper to speak of two methods looking towards this end which have received attention of late years, viz: the method known as "amputation of the pulp," and that of "capping with oxy. chl. zinc." The first named of these methods claimed the renewed attention of the profession some four or five years ago, by the improved operation as devised by Dr. W. W. Allport, of Chicago. This improved operation consisted in excising a portion of the pulp and in trimming and smoothing the edges of the orifice of exposure, thoroughly removing the debris, so that no irritation could arise from roughened edges, or from spiculæ of bone impinging upon the delicate structure of the pulp. The careful capping of this after the operation with bibulous paper, and filling over that with Hill's stopping, left the parts to heal and to throw out a deposit of secondary dentine for their own protection.

This operation is doubtless in harmony with physiological and pathological laws, and under the hands of its originator was unquestionably successful to a certain extent, but the very great delicacy of manipulation necessary to secure good results, and the limited number of cases of exposure in which



it could be at all applied would seem to render it of practical value to the profession generally.

The method of capping with oxy. chl. zinc appears to have been in use with Dr. Keep of Boston as long ago as 1855, and so far as is known he was the first to use oxy. chl. zinc for this purpose, though others may have also experimented with it as early as that who are not known to the commission.

Dr. Keep called the attention of the profession to this method in a paper sent to the dental convention which was held at Saratoga or Niagara in 1858 or 1859, entitled "A simple and successful method of filling teeth with gold over exposed nerves. By N. C. Keep & Son.

For some reason but little attention seems to have been paid to this method by the profession generally until some time after the meeting of this association in Boston in 1861 when Dr. Atkinson, of New York, called attention to it through the dental journals, claiming remarkable success for it. The method generally in use probably is in the nature of that suggested by Dr. Atkinson, viz: of thoroughly removing all diseased dentine from over the pulp, even to causing the pulp to bleed, applying creosote, chloroform, aconite or morphine to subdue the pain; after drying thoroughly the cavity, applying a small drop of creosote immediately to the exposed point, and then flowing the oxy. chl. over it after the thorough settling or hardening of the oxy. chl. in the cavity either to be permanently filled with gold or temporarily with Hill's stopping. This method of treating with oxy. chl. zinc has probably been more generally adopted than any other ever before introduced, and with a degree of seeming success that warrants the hope that with some modifications of practice as may come in the future as the result of study and experiment in this direction, it will be found that the great desideratum has been attained in dental practice whereby the vitality of the pulp of the tooth may be preserved after absolute exposure even of long standing. Yet until the nature of the action of this remedy is better understood, and until a longer time shall have furnished

evidence regarding this practice, success can not be absolutely affirmed.

There are some of our best men who claim for it complete success with scarcely any exceptions. Others again, equally reliable and careful as practitioners, assert that the death of the pulp ensues sooner or later in almost all cases. But the weight of the testimony seems to be in favor of its success. While this is so, it would be clearly unwise to reject the practice because of some unfavorable results, until a longer time shall have elapsed as the test of those earlier operations which up to the present moment certainly have proved successful. The mind of the profession should rather be bent upon the study of the subject in order that the remedy and its action may become thoroughly understood, so that those modifications of practice may be determined which shall give greater certainty to the practice in the future.

It will not be attempted in this report to explain the action of this remedy, but only briefly to refer to certain observed facts concerning the practice, and to make some general suggestions concerning the details of the operation and the cases in which most hope of success may be indulged.

That a deposit of secondary dentine or calcific material does take place in some cases after treatment by this method there is ample proof, numerous instances being vouched for by some of the most reliable men in the profession, but how generally this takes place of course can not be known, as comparatively very few cases are examined with reference to ascertaining this point. It has also been demonstrated that many teeth having been thus treated have evinced satisfactory evidence of the vitality of the pulp after a lapse of two or three years or more, upon the application of ice in direct contact with such teeth.

Again, it has been affirmed by a class of observers in certain localities that in most cases in which the pulp has been found to be dead after this treatment, there had been little or no pain or soreness or disturbance of any kind after the

operation, and that when the pulp chambers of such teeth were opened, they and the root canals were found to be entirely empty and free from moisture or evidence of decay in position. These seem to be the prominent and noticeable facts concerning this practice, and in view of the last mentioned might it not be suggested in answer to the objection urged by some "that the pulp is certain to die sooner or later in most cases;" that if it dies in the manner as claimed by some as above stated, and the interior of the tooth is found in the condition named—is it not then in better condition than it would likely to be in, in a majority of cases had the pulps been destroyed in the usual manner?

With reference to the details of the operation, it should be strenuously insisted that the greatest thoroughness be essential in removing all diseased structure and cleaning the cavity of all debris, that no irritation may arise from those causes after the completion of the operation. Again great care should be exercised to avoid irritating the pulp beyond what is absolutely necessary, and in applying oxy. chl. zinc it should be allowed to flow over the exposed point, and should never be pressed until it has thoroughly hardened. To the neglect of some one of these vital points may unquestionably be traced some if not most of the troubles which have occurred in cases of recent exposure.

The great irritation and pain produced by the immediate contact of the freshly prepared oxy. chl. with the exposed pulp, even when a layer of bibulous paper saturated with creosote is interposed, would suggest the propriety of the adoption of some mode which should lessen, if possible, the pain and irritation.

In this connection the practice of Dr. Geo. O. Howland of Galena, Ill., is worthy of trial. He uses a preparation of which the following is the formula:

Saturated alcoholic solution of morphia, one part; turpentine and one half parts ether. In this mixture dissolve as much gun cotton as it will take up. With a camel's hair pen

he applied a few coats of this over the point of exposure before flowing over the oxy. chl. zinc.

This preparation he claims adheres closely to the tooth and pulp, forming a pellicle that will not crack, and under which in some cases, with the aid of a lens, the pulp may be observed distinctly to throb.

This he claims prevents to a great extent the pain which generally follows the application of the oxy. chl. zinc. The cases in which treatment by oxy. chl. is most successful are unquestionably those of quite recent exposure, where there has been little or no pain previous to the operation. The cases likely to prove less successful are those in which the pulp has been long exposed, with more or less pain, but with slight disorganization of the structure of the pulp; and those cases least likely to succeed are where the pulp is more or less ulcerated or gangrenous. In the latter cases perhaps the best practice is to secure, if possible, by treatment with creosote, or otherwise a sloughing off of the diseased portion of the pulp; when, after that has taken place, careful manipulation and thoroughness in details, as in the cases of recently exposed pulps, may give some hope of success.

In concluding these remarks upon this subject, it should be observed that the operation under discussion is one requiring great nicety of manipulation and an understanding of what is being done, and it would be absurd to expect uniform results in miscellaneous practice, when so great a "diversity of gifts" must necessarily exist among the profession at large.

But the conclusion must be forced upon every candid mind that in view of the general testimony in its favor, the practice of capping exposed pulps with oxy. chl. zinc has been proved to be the most successful thus far introduced to the profession tending to the preservation of the life of the dental pulp, and may justly claim to be a very important adjunct in operative dentistry. It certainly demands the careful, thorough study and experimental investigation of the profession as giving promise of the highest results in the direction of conservative practice.

We come now to the consideration of the somewhat startling views of Dr. Arthur, as promulgated in his book published a few years since, in which he advocates a marked modification of general practice for the preservation of teeth, and insists upon a heroic use of the file as the means of preventing and arresting decay in these organs.

Startling as these propositions doubtless were to the profession generally, the careful consideration of them will show them to be not entirely devoid of reason. In introducing such a practice, the author has to contend against the strongest prejudice probably which ever settled the minds of men, both with certain members of the profession who are numerous, and with a large portion of the public.

That Dr. Arthur's views are extreme there can be no doubt. No man would be likely, after elaborating his own mind such a system, as the result of years of study and observation in that particular direction, to announce to the profession without occupying very extreme ground, that all his propositions should be characterized as unworthy of thoughtful consideration, does not follow as a matter of course. This report could hardly claim at completeness did it ignore Dr. Arthur's views, although they can not be said to be fully adopted by the profession, or the practice they advocate to have been to any extent general, yet there can be no doubt but that the practice generally will be largely modified in the coming years through their influence.

Dr. Arthur presents for our consideration a system the result of long and careful observation and experiment, and sustains his views by much sound reasoning and so plausible arguments. Views presented under such conditions are always entitled to thoughtful consideration, however erroneous they may appear at the first glance, and it would be strange indeed if no good were to be found in the search instituted by him after truth.

That the teeth may be filed away to a considerable extent without greatly increasing their liability to decay, is believed admits of no question. The proposition that

if sound and thoroughly polished, will resist destructive agents nearly if not quite as well as enamel, can hardly be controverted, and that judicious filing will not only arrest but prevent decay to a great extent, must be apparent to every observing practitioner of long experience. That all the teeth back of the cuspids should be separated with the file, whether decayed or not, in case the incisors are decayed before the twelfth year, this report is not prepared to admit, but that a more general and more thorough use of the file as a means of prevention, would, under Dr. Arthur's method, in certain cases, prove of vast benefit, there can be no doubt. Accumulated experience seems to tend to confirm this view, and it is not improbable that the next ten years will demonstrate to a large extent the soundness of the major part of Dr. Arthur's system.

It must be understood that this report does not admit the propriety of *indiscriminate* filing, but of *judicious* filing, and it should be remembered that certain classes of teeth under certain conditions will scarcely admit of filing at all ; certain others of filing only to a limited extent, while some may be filed away to a very great extent without injury or serious objection. It should ever be borne in mind that in speaking of operations or methods, reference is made to their performance as they should be performed, thoroughly and perfectly, and in considering the different modes of practice we should not lose sight of the fact that because certain modes fail in some hands they do not necessarily fail in all. It is not unreasonable to suppose that where failures are the rule with some, and yet that the same operations are generally successful with others, that the failures are largely due to the absence of some of the conditions within the power of the informed and skillful operator to supply, which are essential to success.

In coming to the consideration of the latest and most marked change in practice in regard to filling teeth, that is the substitution of heavy foils for those formerly in use, we are brought to the discussion of the most complete revolution



in ideas and practice that the profession has ever witnessed. So great was this revolution, that although the fact is established beyond controversion that heavy foil is the best above all others for securing the best results, yet inquiries have hardly ceased to wonder that so great a change could have become so quickly established or to wonder to what an extent as this unquestionably has. When Dr. A. suggested the use of heavy foil one year ago, the profession probably very few in the profession but that regarded the proposition as the vagary of an enthusiast. To-day the practice may be said to be becoming very general.

When it is borne in mind that the tendency for many years has been towards lighter foils, and that many of the best operators regarded No. 2 as the best adapted to secure the highest results and when we consider that this new practice proposes to substitute for numbers 2 to 30 numbers 30 to 240, the magnitude of the revolution becomes apparent. But in spite of the seeming absurdity of the proposition, it is believed that there are sound philosophical reasons to support the claims made in behalf of the heavy foils.

The endeavor will be made briefly to state these reasons and to further state what experience seems to have established concerning their use. To reconcile this proposition with the new principles of philosophy, it is only necessary to consider how light foil is used. It is prepared for use by being folded upon itself a greater or less number of times according to the mass required and the particular application which it is to be applied. This is the manner of its application whether used in pellets, blocks, cylinders or otherwise. It presents then, when thus folded a mass from ten to twenty times as thick as the foil from which it is prepared. A mass prepared from No. 4 foil it would represent by multiplication of thickness Nos. 40 to 160 of heavy foil. If then, a mass of forty layers of No. 4 foil can be packed successfully, it is not one layer of 40 to 160. Practically, this would be easily accomplished, because when light cohesive foil

folded upon itself, it is always with a greater or less degree of irregularity, and the force required to condense a mass thus prepared must necessarily be greater than for a single layer of same thickness, because the mass of folded foil presents innumerable surfaces and angles braced in every direction against each other and cohering at every point of contact, which offer a much greater resistance than a single layer corresponding in thickness would do, while there are largely increased surfaces to weld together.

It would seem to be unnecessary to say another word in support of the philosophy upon which the claims for heavy foil are based.

With regard to what experience has demonstrated concerning their use, it may be said that as high as No. 60 is applicable to all cases where the mallet can be used, even in the most frail teeth, when those experienced in its use would think it must surely fail. But it seems to be established that foil as heavy as No. 60 is peculiarly adapted for use against frail walls, that it is in fact vastly superior to the light foils. It accomodates itself to irregularities with great facility, requiring but slight force to place it properly and thoroughly in position, and in fact gives immediate support to the frailest wall, and renders operations in such cases less difficult and dangerous. No. 60 for filling retaining pits is much better than lighter numbers, making more certain and solid anchorages.

The higher numbers of foil are very much more cohesive, and consequently when properly packed must make a stronger as well as a more solid filling, while owing to this greater cohesiveness as well as the greater softness of numbers as high as 60 and upwards, really less force is required to condense them thoroughly than the numbers from 2 to 20.

In one class of cases the heavy foil seems to possess peculiar value in binding one part of the filling to another. For instance, where a cavity in a bicuspid or molar extends from the approximal surface over to the crown, where the approximal cavity may be very shallow, and as is frequently the



case, it is impossible to secure thorough anchorages at the base of the cavity or elsewhere, but where strong adhesion can be obtained in the crown cavity. In such cases, after securing as thoroughly as possible the base of the filling in the approximal cavity, and thorough anchorage in the crown, a narrow strip of No. 120, well secured in the crown filling and carried over to the approximal portion and so carried back and forth two or three times, will secure the approximal portion as no other method could possibly do. So, too, in building across the ends of the incisors where there are approximal cavities running into the groove between the cutting edges or surface; this method secures the approximal fillings from any possibility of becoming displaced. In this class of cases it is believed that the heavy foils give the performance of operations of a more reliable and of a more permanent character than could be attained with any other method. In building out and restoring the contour of the tooth, especially on the cusps and across the cutting edges, where great strain comes upon the filling, the much greater strength which the heavy foil gives, is invaluable, and renders the operations less experimental than they have some times been considered when made with the light foil.

One feature peculiar to heavy foil deserves especial mention, and that is that it spreads more laterally in condensing than the light, a fact which should be carefully borne in mind, as the same mallet force applied throughout an operation with heavy foil, as would be used with the light, would in some cases fracture the tooth, and often check it to a greater or less extent. To sum up in a word the merits of the heavy foil, it makes when properly used the most perfect operation that have yet been attained.

It is objected by many that the profession is wild in this matter, that too much is claimed for this practice, and that until the test of time has stamped it with the approval, it should be claimed as a success.

This would seem to be a not unreasonable proposition, and as to new methods and practices generally is unquestionable.

ably a proper caution to observe; but the matter under consideration seems to be exceptional in that it carries conviction of its permanency with it. It seems to be susceptible of demonstration to those who have used the heavy foils that there can be no failures chargeable to the material or method—that the assurance of permanency is as positive now as though years had added their testimony.

It can not be feared for this material, as in the case of "plastic gold, that after a time fillings would be found to be disintegrating and crumbling away and failing at the margins." Gold plate does not disintegrate, and if heavy foil is properly placed over the margins of cavities, there can be no crumbling at that point. These operations have been submitted to the severest tests possible, except that of time, and the most powerful lenses and the most delicate points fail to discover any evidences of weakness or failure, while the working of the heavy gold carries conviction to the mind of the operator, as the working of no other ever did, that strength and durability are the marked characteristics of the new method of practice. It has been urged by some that they fear by and by it will be found that fillings are falling out, or leaking at the margins. Have the gentlemen who have these fears never seen failures or leaking at the margin from the use of light foils? There has not yet been discovered any material for filling teeth that renders unnecessary the use of brains.

It is not expected that the highest results will be reached with heavy foils through careless or slipshod operations. But it is believed that thoroughness and skill will produce higher results with heavy than with light foil; that those who produced fillings with light foil that did not leak at the margin, will produce them with more certainty by the use of heavy foil; and those whose fillings of light foil did not drop out will make them of heavy foil with greater promise of durability.

Perhaps not the smallest merit of the heavy foils is that of the almost impossibility of the conscientious operator

making an imperfect operation without knowing that it is. Very many operations conscientiously performed with light foils have failed because of the deceptive appearance and imperfect evidence of thoroughness to the operator at the various stages of the operation. In condensing rubber on light foil it is very easy to be misled by superficial appearances, as a pellet of light foil may sometime seem thoroughly condensed and to have cohered throughout the whole mass, which is only superficially condensed and is not attached to the filling by few and largely separated islands of cohesion, while such is hardly possible to occur with heavy foil.

Every step of the operation must be thoroughly performed and the operator is aware of this fact from the evidence continually before him.

*(To be continued.)*

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### ARTICLE III.

#### *Flexible Edge for Rubber Plates.*

By Dr. S. J. McDougall.

Have soft rubber rolled in sheets long enough to extend around the entire plate. Make your calculations on a model how far up and back you wish the plate to extend. Cut a strip of the flexible or soft rubber the desired width, run it around on the model and stick it there (rubber dissolved in chloroform answers a good purpose). Of course the upper and posterior portion of the flexible edge will be the upper and posterior portion of the plate.

Now with the trial plate on the model, wax up to a little above the lower edge of the flexible strip. When fitting the case in the flask for packing, imbed the flexible strip in plaster so that, when the halves of the flask are separated for packing, the flexible strip will remain on the model. Pack and vulcanize.

The great objection to this kind of work is, it will last only from six to eighteen months.

A day or two since I had a letter from Dr. Dudley, of Salem, saying he had used and published it some years ago, before a patent was obtained.

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ARTICLE IV.

*The Duty incumbent upon Dentists to attend Associations.*

By ARTHUR S. FORD, D. D. S.

As the time rapidly approaches for the annual session of the Southern Dental Association, I think it not inappropriate to impress upon the minds of my professional brethren the duty that they owe not only to themselves, but also to their profession and their patients, to embrace every opportunity to perfect themselves as operators, and more especially at this present time, when the whole scientific world is on the "qui vive" for improvements, and when, as I fondly believe, our own profession is keeping pace with the "march of intellect" in the known professions, and is making giant strides towards perfection, by substituting improved modes of treatment and operating, together with new instruments and appliances.

There is, in my humble opinion, nowhere, such an opportunity offered to the practitioner for advancement towards proficiency, by the interchange of modes of practice and by seeing and learning all the latest improvements in operating, in instruments and material, as that afforded by attending Dental Associations and Societies. Such is admitted to be a fact by all progressive dentists, and if true with regard to local and State organizations, how much more so must it be, when the accumulated learning and experience of the whole country is convened in a general Association.

I would therefore urge upon my professional brethren, North, South, East and West, to forego all but providential, considerations, and let us meet in Charleston S. C., for mutual improvement on the the second Wednesday in April next.

Let not any ignore the capabilities of others to improve or too modestly underate their own abilities to acquire knowledge. We are all susceptible of improvement, and there are that cannot advance some original idea that will be of advantage to the many.

Therefore let us lay aside all private prejudices, and sacrifice all personal benefits for the advancement of our profession and the good of mankind, and let us each in our approaching sessions of the Southern Dental Association to learn or teach according to our abilities, and labor continuously to elevate the standard of our honored profession not only in America but throughout the world.

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## SELECTED ARTICLES.

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### ARTICLE V.

#### *Inflammation of the Antrum.*

By Professor CHASE.

The antrum or maxillary cavity is of considerable size. It extends on its buccal boundaries from the first bicuspid posteriorly to the posterior roots of the third molar. Its floor is a portion of the palate, and its roof the orbit and eye. Its inner walls forms part also of the cavity, and its outer wall is continuous with the outer alveolar plate of the upper molar and bicuspid teeth. Its only opening is into the nasal cavity, and is a narrow and long one at the top of the maxillary sinus.

The antrum is lined with mucous membrane of the same character as the nasal passages with which it is continuous through the opening just spoken of, and which opening is very much reduced in size when this membrane is inflamed and swollen.

The mucous membrane of the antrum completely lines this cavity, and performs the same function as the mucous membrane of the nose. Inflammation here is so different in character from that of the nasal membrane, and is concomitant with it.

The roots of the molar and bicuspid teeth often penetrate the antral cavity in their growth, their ends of course being covered with their percimentum, and the mucous membrane of the sinus.

When the teeth thus situated become diseased, they are a prolific source of antral inflammations.

For instance, the pulp of a tooth dies, it disintegrates in its own cavity, the gases produced from its decomposition or putrefaction, pass through the foramini of the roots and create irritation and inflammation in the surrounding pericemental tissue. These roots penetrate the antrum and set up inflammation in its lining membrane. The first symptom of antral disease is a dull pain in that side of the face, and a dryness of the nostril of the affected side.

Now, you must know that in health the lining of the antrum assists by its natural secretion of mucus in keeping the nostril moist. So too, when it participates with the *nose* in inflammation produced by a "cold in the head," it furnishes its proportion of mucus and watery exudation which is so annoying in acute nasal catarrh.

The second antral symptom is this increased flow of mucus, which is the second stage of inflammation in mucous membranes everywhere.

You will be careful then, to examine the nostril of the affected side, in your diagnosis of this disease, so as to discover whether or not the nostril of one side corresponds in condition with that of the other.

Now you must not fail to understand that the opening from the antrum into the nostril may become so closed by inflammation and consequent swelling, that no fluid can pass through it. In this case then the fluid must remain in the antral cavity, as there is no other outlet. If this is really the condition of things, the contents will probably become purulent and there will be considerable pain in the face, redness of the cheek, and more or less swelling of the soft tissues.



If science is not called to relieve the patient at this stage, then the bones gradually become absorbed, and growing bulge out, either on the buccal or palatine wall, or the nasal wall. Not unfrequently has the eye been pushed from its socket by this engorgement of the antrum. The nasal wall at last gives way at some point, and the pent-up pus finds its way through the soft tissues to the surface, forming a fistulous canal and opening at almost any point on the face, even on the under jaw, so as to give rise in some cases to a supposition that one has to do with an alveolar abscess of that bone.

You must not suppose that this is the most frequent mode in which antral inflammations progress and terminate. The antro-nasal opening is not so often closed, and then the muco-purulent secretion passes through the nostril, and is always to be found there in greater or less quantity. The best time to see it is after the patient has been lying down with the head resting on the unaffected side. This position allows the fluid to run out of the cavity into the nostril.

In healthy constitutions this state of things may continue for months and even years without any general disturbance of the system, or without exceeding its present bounds. As it is often unappreciated, the patient supposing that he has only a nasal catarrh. This is more likely to be the case when the exudation passes into the posterior nares and into the fauces, instead of appearing at the nostrils.

The exudation in old cases, and repeatedly in bad constitutions is likely to become very offensive. The stench is sometimes intolerable; these cases are likely to be called on for surgery.

In syphilitic, scrofulous, and scorbutic constitutions antral inflammation is likely to be chronic and is of the most offensive character.

I have already said that acute nasal catarrh is often the companion of antral inflammation; when the latter is dependent on the former, it is likely to cease when the cure of the catarrh is effected.

## TREATMENT.

This must be on general principles. Remedies should always be addressed to the general constitution of the patient, and also to that particular phase in which the constitution may be at the time.

For acute and antral catarrh you may soak the feet in hot water to the knees. Give a night sweat; hot bricks to the feet and plenty of cold water in the stomach—five or six tumblers full. Blue mass pills of three grains each, at bed time, and a saline cathartic in the morning, may be useful. But my favorite treatment would be the third attenuation of aconite in the inflammatory stage, for half a day, and, if necessary, followed by *mercurius vivus* third dec. trit., two grains every hour until better. I have often relieved these cases with one dose of the mercury, and effected a cure in from three to four.

You should always examine the teeth of the affected side, and very carefully too, for the cause may lie in an apparently sound one. Press the tooth on examination, from side to side; rap upon it with an excavator handle; look between the teeth for a cavity of decay.

If you find the offending tooth, it will usually respond by pain—a sore feeling more or less extensive. But it may be there will be no pain, only a very considerable looseness of the organ.

It is surprising how the system comes to tolerate a dead tooth, which is causing a constant exudation of purulent fluid into the antrum for months, so well that no pressure upon the tooth produces pain, and yet it may have produced so much absorption in the surrounding tissues that it is loose enough to be extracted by the fingers. No hesitation should be used in *extraction* of such a member, which done, there will probably follow a gush of purulent fluid.

Still you must not surely expect this to be the case, for there may be no opening from its alveolus to the interior of the antral lining mucous membrane, until you push an instrument through it.



Now then, take a crescent drill and explore the bottom of the socket ; the bone may need to be drilled away to enter the alveolar opening into the antrum, but you may find soft tissue at the bottom, instead of bony wall. Push through it and explore the antral cavity. Instead of finding an empty cavity here, you may find it to be more or less filled with a spongy mass. This is to be torn to pieces in every direction if present, so that your cautery may act on all its parts when you introduce it.

Whether the cavity is thus filled or free—and it is more likely to be the latter than the former—you will syringe out thoroughly ; first with warm water, then soap and water. If the opening into the nose is patent, you will find the fluid injected escaping in that way. After this cleansing, throw into the cavity ten drops of kreosote in an ounce of tepid water. While using the kreosote you will prevent the mouth from the regurgitation of the fluid through the alveolus ; to this end you can pack some cotton or lint around the tube of the syringe, and when the latter is withdrawn, but little fluid will follow it.

To avoid its escaping into the nostrils, let the head be thrown towards the side upon which the extracted tooth was situated. This will bring the opening uppermost, and the cup will not so easily run over.

Instead of kreosote, tincture of iodine or chlorate of potash may be used, but I prefer kreosote. Carbolic acid may be substituted for the latter, as there is but little difference between them.

A piece of tape should be crowded into the place lost to prevent its closing up too soon, which it is not likely to do if you see your patient the following day. You must expect some considerable pain to follow your operations, which will be increased the following day.

You had better *not* repeat the injections as soon as the following day, there is always danger of over-medication. Wait three or four days and observe the result of what

have already done. It may not be necessary to give the cavity a second cauterizing injection.

I have already said that attention should be paid to the general system, and your remedies must correlate with the present dyscrasia of the constitution, whether it be syphilitic, scrofulous, anæmic. This paper would be unduly lengthened were I to particularize in regard to these conditions.

A wholesome and generous diet, however, is never at variance with purulent formations in the antrum.

Let us now suppose a difficult condition of things. For instance, there is no diseased tooth which causes this disturbance! There is no decayed tooth on this side of the upper maxilla! What then? Shall we extract a sound tooth for the purpose of reaching the antral cavity? By no means; sound teeth are not thus to be sacrificed, notwithstanding the authority of surgical authors.

We can very readily penetrate the antrum through the thin wall above the roots of the second bicuspid tooth, or above those of the first molar. Take a strong gum lancet and make a V-shaped cut through the soft tissues on the place designated—the point of the V pointing downwards; then with a trocar or dental drill of large size, bore through the bone. You will not find it very thick—only from an eighth to the thirty-second part of an inch in thickness. Here you can institute your treatment as already directed, being careful to keep the opening patulous, by the use of a strip of tape. I recommend the use of tape instead of lint or cotton wool, for the reason that there is less danger of its getting lost in the antrum, such things have happened, and are not pleasant as they complicate the case sometimes.

If tape should be lost, it can easily be withdrawn by getting hold of one end with an excavator or tweezers. A lint of cotton or wool might be only withdrawn piecemeal as it readily separates.

When this disease has been produced by foreign bodies in the cavity, as a dead root which has been forced into it

in the operation of extraction, then the socket through it was drawn is to be enlarged at the bottom with a drill or burr, and exploration made from this point.

Don't be afraid of making too large an opening ; there is no danger but what nature will supply with new bone. Make as large a cavity as you choose to make. One large exit for the root to make its own exit from, easily, is the best.

In all these cases you will find mercury useful in the manner previously described.

I will now detail a few cases occurring in my own practice, illustrating treatment, and which may be more interesting to you than general descriptions :

CASE 1. Mr. B., age thirty, has had the second bicuspids of the left side extracted, thinking it diseased, as he has suffered much pain in that locality. The patient says the tooth extracted was not decayed. Pain continuing, he consults me. There are no decayed teeth on that side of the mouth. None feel sore by rapping them. There is, however, pain on pressing hard against the antral wall. There is, also, unusual dryness of the nasal passage of that side. I diagnose acute inflammation of the antrum. I drill through the vacant socket of the tooth extracted very readily, and syringe with warm water. There was no exudation of any character, when the drill was withdrawn.

Tincture of nut-galls with twenty drops of laudanum is now injected into the antrum, and a tent left in the opening until the next day, when I see the patient, who thinks he is considerably improved. No medication to-day, but he is syringed with warm water and tent left out.

Patient called again the fourth day improved ; syringed with water and injection of tincture of nut-galls and laudanum. Sixth day patient discharged well.

CASE 2. Mr. S., age forty, works in a flouring mill. Sent for me to extract the right upper second molar. I found it undecayed but tender on percussion. I explored the right nostril and find some mucus in it, much more than on the opposite side. On enquiry, learn that there is

more in the morning after lying on his left side. Discharge not offensive to smell.

*History.*—Two nights ago, he worked all night in the mill, but took a nap, laying his head upon a bag of damp bran. He took a cold, too, as well as a nap, and got rheumatic pains in his limbs. It seems also that he got rheumatism in the tooth spoken of, that is, pericementitis, or periostitis. This, too, is the way he got inflammation of the antral mucus membrane. The roots of this molar undoubtedly penetrated the antrum.

*Treatment.*—Feet in hot water; go to bed with hot brick to the feet. Mercurius vivus, third decimal trituration, two grains every hour until better. Saw patient next day so much better that medicine was discontinued and patient discharged.

CASE 3. Mrs. P., age thirty, scrofulous habit. Present condition: considerable fever, left cheek swollen so as to nearly shut the eye, skin of the face inflamed and red. Left nasal passage obstructed so as to be unable to breathe through it. Slight constant discharge from left nostril of a purulent fluid, greenish color and very offensive. Left bicuspids and molar teeth covered with tartar so as to almost conceal them in the mass. Formerly had tooth ache a good deal on this side.

*Diagnosis.*—Inflammation of antrum from purulent periostitis, following death of a dead tooth which I will find under a mass of tartar. Probable total closure of the antro-nasal opening from chronic inflammation.

*Treatment.*—Removed tartar from the teeth. Find the first molar with crown cavity of decay extending to pulp, which has apparently long been dead. Extract the tooth, a gush of offensive purulent matter flows from the open socket. A large fungus mass covers the ends of all the roots. It is white, and is only a tumor of pericemental tissue. An opening almost as large as the crown of the tooth is found leading from the alveolus to the antrum. This

cavity is syringed with soap suds, followed by kreosote ten drops to an ounce of water.

Thursday. Considerable pain in the cavity yesterday, better to-day, and scarcely any discharge; from the cavity has ceased. Can breathe through the left nostril. Injection of tannic acid and water. Fourth day, discharged. Cured.

Here was an alveolar abscess absorbing floor of sinus and filling cavity with purulent fluids which could be evacuated only by the nose.

CASE 4. Mrs. G., washerwoman, age fifty; had roots extracted from socket of left second molar, at hospital. Intemperate habits. Syphilitic blood dyscrasia. Has had pain in face ever since the operation, three years since. Muco-purulent discharge from the socket now. Instrument readily finds its way from the socket of the fine root into the antrum. She does not know whether root was extracted or not. I suspect that it was forced into the sinus by the root forceps. The floor of sinus probably weakened by alveolar abscess which she says she had.

The alveolar-antral foramen is too small for exploration. I enlarge it with a rose drill of the largest size, and with chisels. Syringe the parts. Can now explore cavity but find nothing. Fill cavity full of warm water and ask the patient to keep the head level, hoping as the water goes out through the alveolus it may bring root to operation. After three or four trials, am rewarded with success. Root comes out with the rush of water, not more than sixteenths of an inch long. It has some loose pericementum about the end. Kreosote, five drops to an ounce of water, for injection. No other treatment was found necessary.—*Missouri Dental Journal*.

## ARTICLE VI.

*Therapeutic Power of Oxygen Gas.*

By T. D. CROTHERS. M. D.

Oxygen has been used as a remedy in disease over a century. The difficulty of separating it from the air, and using it at the bed-side of a patient with its cost, have been obstacles preventing its introduction into general practice. Now, by the process of "Lessis du Motay," immense quantities can be procured, and sent to all parts of the country at trifling cost, in compressed cylinders. The phenomena of life is kept up by nutrition, and absorption of oxygen gas from the air. Oxygen sustains the most intimate relation to life. All other elements may be withdrawn and life will continue for a time; but, if oxygen is withheld, death follows. The secretion and excretion of every atom in the body depends upon the pressure of oxygen. The chemical action of oxygen, on the elements of food, is the ultimate cause of all vitality. Oxygen, and all the elements of food, are taken into the body through the channels of the blood. This fluid not only carries oxygen to the ultimate parts of the body, but is renewed by it, and depends upon it for force and power. When we give iron it is to increase the absorbing power of the blood for oxygen. The true tonic is oxygen. When iron is given fresh air must be increased, or the remedy will fail. A condition of health depends more on the amount of oxygen absorbed than upon nutrition. The absorbing power of the blood may be impaired. Here Dr. Smith, of New York, suggests that, "a deficient absorbing power may be supplimented by an increased supply of the material absorbed." And this explains some of the remarkable results from oxygen especially phthisis. Where the disease is both of the respiration and nutrition of the body, here oxygen not only aids the blood in bringing material to be built up, but supplies the building up power, and lessens the increased action of the lungs to supply this want from the atmosphere. Experience does not confirm the



theory that oxygen gas, in contact with inflamed and irritated surfaces, will increase inflammatory action. Dr. Smith, of New York, the highest authority on this subject, has recently given 1,100 gallons of pure oxygen gas in 24 hours with no ill effects. The pulse, after inhaling oxygen, becomes steady and regular, often increased in frequency a few beats. The temperature decreases or remains the same. Oxygen is applicable, says Dr. Smith, to two classes of cases—one in which respiration is at fault, and the other in which both respiration and nutrition are defective.

Under the first class are included Asthma, Emphysema, Croup, Diphtheria, Capillary Bronchitis, Pneumonia, and Opium poisoning. Astonishing cures have followed the administration in each of these diseases. In asthma the attacks will be relieved, and a cure will follow in a large per cent. of all cases. In capillary bronchitis and emphysema, its effects may be depended upon. In pneumonia of a typhoid type, the results are very gratifying if carefully used by judicious men. In a low grade of disease with anæmia, no remedy will act so promptly. In one of my own, convalescence was established on the fourth day after the administration began. In a severe case of asthma which had resisted all medication for years, complete cure followed after two inhalations of 6 gallons each. In diphtheria it is almost a specific; and if of no value in any other disease, its value here would establish it as indispensable.

In the second class of diseases, in which both respiration and nutrition are defective, phthisis stands first. In this disease oxygen is the most valuable remedy we possess. It has been used more in this disease than any other, with results exceeding all expectation. One case under my treatment the patient gained fourteen pounds in fifty days, a rapid convalescence, which are strong indications of complete cure.—*Buffalo Medical Journal.*

## ARTICLE VII.

*Double Hare-lip.*

The case now before the class (a man 30 years of age), is that physical imperfection known as hare-lip. In this particular instance it differs, however, markedly from the others which it has come in my way to treat before you, in being a compound or double cleft.

In the usual hare-lip, as all here well know, the deficiency consists in a V break in the continuity of the part. The double break varies as markedly as the first is true to a type. The case before us is a fair example of what you will meet with in this direction of practice. It is not a complicated case neither it is a simple one. First you observe a break involving one-half, or much more nearly two-thirds, of the superior lip—an example of what is meant by deficient development. That nature, however, attempted, but was thwarted in her work of here making a perfect lip, is evidenced in that we find hanging from the septum of the nostrils a misshapen fleshy mass, the abortion, without doubt, of the lacking portion of the lip. This centre teat or part in these cases, is the *pons asinorum*, and it so various—so diversified in its relations to adjacent parts that the question of concern, in all such operations, is, what shall we do with it? Here, in the case before us, for example, is this teat so outside the harmonious line of the lip that a strip which should rest upon the cutaneous surface of either side, would pass beneath the mucous face of this middle piece.

As another example, I will here introduce a second patient, this infant, but three weeks of age. You have seldom seen anything more curious looking. It seems to have a fleshy door knob hanging from the tip of its nose. The child has scarcely the remnant of an upper lip, and what is a great deal worse, there is a complete break, both through the hard and soft palate, rendering the nose and mouth a common cavity, and which cavity has neither anterior or posterior closure, being, thus of course, always open. The babe can-



not suckle; and when milk is poured into this cleft, the attempt at deglutition throws about as much back as it goes down the œsophagus. Observe this case particularly, and compare it with the first, since it enables me very well to show the two extremes of complicated hare lips. The unculated prominence hanging from the nose of this child is the rudimentary lip, and who shall say how much of the absent palate enters into its composition? All the incision the tumor is made up of bone; this the knife will be able to demonstrate to us. The condition of this child is favorable, and I shall exert myself to the utmost, you may be sure, for its relief.

In the meantime, until we come to the operation, consider it, each one of you his own patient, and devise in your mind what kind of an operation you conceive best adapted to meet the requirements of the case.

From any operative standpoint, we divide the subject of double hare-lip into two classes—simple and complicated. Such a division answers our purpose very well.

Let us then for a moment refer to an uncomplicated double hare-lip where the centre piece or teat might be so large and square as fairly to divide the lip into two parts; now here, the median line of the lip would be in the center piece; it would, therefore, I think, suit itself to any one that either side of the cleft was to be treated as a separate hare-lip—that is, the whole operation might be very well done at one sitting, but there would necessarily be symmetrical parings made of either cleft. In such cases we have also to take into account the concavity made by either of the sides of our fissures, as reference is had to the influence exerted on the free margin of the lip; for here, of course, we require no lateral made swell.

Whether again in these really double cases we would operate on the one side, and when this was cured operate on the other, is a matter for the judgement of the operator. Some surgeons prefer to correct the whole deformity at one sitting. If he should do this, the operation would only

ate from the principles laid down, as regard would be had to the approximation of the parts. If the center-piece is small, I think it would be found the most satisfactory practice to pass the pins directly from one lateral flap to the other, on through the central teat, thus uniting all the parts together by a common suture. If, on the contrary, the center-piece is broad and well covered with skin, I think the greatest good is found in using two sets of sutures.

As regards the single or double operation, I myself am influenced by the width of the middle piece, the tenseness or laxity of the tissue of the lip, and the endurance and condition of the patient.

Another modification of the double hare-lip is one in which there is a projection into the cleft of the incisor teeth, the alveolar process being sufficiently normal to allow of non-interference with it. The projection of the teeth is a natural result of the lack of external support from the labial deficiency; the tongue has actually pushed them outwardly. This explanation will, I am sure, seem strange only to those who are acquainted with the exceeding mobility of the dental organs under slight but continued force. It is certainly the true cause of such projection. In a case of this kind, the preliminary operation is the removal of the teeth. If now six months are allowed to intervene before attempting the operation on the lip, the alveoli of the extracted teeth will be found to have receded through absorption quite the eighth of an inch. The second operation is then to be done, *secundem artem*. This waiting on the process of absorption will be found to conduce greatly to a successful result, but it is not a necessity.

A still better, though more tedious mode of correcting such a deformity, however, is by bringing the projecting teeth back to their normal place in the arch through the agency of elastic ligatures, which is a perfectly feasible operation, and not at all difficult of performance. By such a preliminary procedure we not only get the teeth out of the way, but we also save to the patient those valuable organs. To

make and apply such a ligature, we have only to take a common slip of india-rubber ; attach at either end a loop of silk ; place the loops over certain of the molar teeth (the immaterial which), and stretch the centre or rubber across over the labial faces of the teeth to be pulled in. It is astonishing how quickly and powerfully such a ligature will act upon the teeth, in two or three weeks at the most they will be brought into a proper line. To secure them in situ, and prevent their again being pushed forward, we have only to keep them ligatured in any convenient manner until the operation on the lip is made.

Cleft of the lip, as seen in the case of the babe before mentioned, is found in almost every case of cleft of the hard palate. It has always been deemed very important in these cases that an operation on the lip should be performed as early as possible, since it is thought to favor closure of the cleft. In these cases the operation differs from that of an ordinary one, only when there is a projection of one or both alveolar processes into the break. In such instances if the projection is very marked—that is, so much as to prevent the bringing of the lips together over it—we may perhaps, be able to do nothing better than to cut away the projection. This however, is always to be avoided when possible : first, because we thus destroy the germs of the teeth ; and secondly, because if by any means we can get union of the lip, the proper development will come mutually to accommodate the other. In such cases, some authors recommend that we endeavor to bend back these projections of bone, turning them towards the mesial line ; and when this can be done, answers a very admirable purpose.

Still another mode consists in the employment of a fronto-occipito-labial elastic sling, which pulls upon the projecting process backward from the occiput. It will certainly fulfill the indications, but its application is not unattended with trouble.

The variations, together with all the anomalies in the direction of hare-lip are first to be studied, as regards

cure, from the artistic standpoint. The surgeon knows when and what he can afford to cut ; he knows what nature will do in the case ; it only remains for him to consider well his incision—where he shall make them, and what is to be the result ; before the operation is attempted.

With this general view of the subject which will, I trust, be found by you sufficiently full for a satisfactory guidance in this direction of practice, we may turn to the performance of the operation upon these cases.

First, the man. It is a sad and unusual thing that he has been allowed to grow to adult age with such a deformity. As this central piece is not wide, we can utilize it and make a single operation suffice for both clefts ; that is, we shall pare both edges of this central piece, then the edges of the lip upon either side, and passing long pins directly from the lateral flaps through this teat, bring all four raw surfaces into their proper positions by the single ligature thrown around the pins. In regard to the character of our incisions, it is not here so necessary to use the ellipse or double V parings which I spoke of when upon the subject of simple hare-lip, since we do not here produce in the same way the central median prominence and swell, and our object is, therefore, rather to produce perfectly fresh surfaces at every point that union may be rapid and complete.

[Operation performed as described, the teat being used to fill up the gap between the two flaps, and a portion of one of the parings being allowed to remain in order to add to the fullness of the free margin, somewhat after the manner of the operation of Mirault. But two pins were used, and adhesive strips were immediately applied to assist in support.—De F. W.]

In regard to this little infant, I trust you have all by this time decided as to the operation which you would perform were the case in your hands. The child is but three weeks old, yet in these cases of such terrible deformity the operation must be done early, since the compression effected even by the closure of the soft parts may at this tender age greatly

influence also the bony cleft, for you well know the large proportion of animal matter which exists in the bones of young children, and the ease with which they may be broken. At some future clinic I shall dwell more fully upon the matter of cleft palate, and will not, therefore, now detain you.

I shall now proceed to remove this pendant mass from the septum by means of bone forceps, and, as you will then see, we have to deal with the lip as in ordinary cases of single hare-lip. The break is wide, but I think the tension will not be too great.

[The mass was removed and the lip pared with the double V incision; long pins were used, and the parts easily drawn together by the usual suture, and assistance rendered by adhesive strips. The mass proved to consist of bone (probably the rudimentary intermaxillary) and cartilage. De F. W.]—*Dr. Garretson, University of Pennsylvania*—*Medical and Surgical Reporter*.

## ARTICLE VIII.

### *Paralysis of Side of Face—Treated by Operation.*

By J. E. GARRETSON, M. D.

The following case is recorded simply as an experience which may be useful as a reference:

The lady applied two years back for relief from the deformity exhibited, the irregularity of features being dependent on injury done the facial nerve in an inflammation and necrosis of the temporal bone from accident met with in childhood; paralysis was complete; not the slightest power existed in the muscles of the affected side.

The desire of patient was for a symmetrical mouth and face; the question was, the accomplishment of such an end.

TREATMENT.—A case of this kind treated by any of the various means of nerve stimulation is, of course, a consideration not involved. What is done can only be from the mechanical stand-point. The indications being three fold

1st. To reduce the flabby redundancy of the paralyzed cheek.

2nd. To give comeliness and regularity to the mouth.

3d. To antagonise the muscular action (when in play) of the vital side.

In this case these indications were attempted to be met by means as follows: A study was made of the cheek, and what was deemed to be the redundant tissue was included in an ellipse drawn with a lead-pencil, the apices being, the one, at the middle of the nose, the other, at the angle of the lower jaw. Such direction of the ellipse being with a purpose of raising the angle of the mouth. Satisfied that such removal would be found rightly placed to meet the two first indications, the part was cut out. In the operation the facial artery was the only vessels needing a ligature, and even this, indeed, ejected no more blood than does an ordinary coronary.

To bring the parts together, three hare-lip pins were used, and agreeably to my surprise, so direct and immediate was the union that it was found permissible to dispense with two of them on the following day; the third, the middle one, was left in until the fourth day; but this, not seemingly from any necessity. The ligature, a strand of ligature silk, remained firm for three weeks, and was finally taken away only by the use of a traction quite as great, I should think, as would have sufficed for its removal the moment after it was placed about the vessel.

The result of this procedure was very satisfactory. With the features in a state of rest, nothing more, it would seem, could be desired.

The third indication, however, showed itself a most important one. Emotion of any kind altered this mechanical harmony of the parts and exhibited the non-vitality of the side operated upon; that is to say, that in laughter, for example, the superior and lateral levators would pull up the well angle, with no corresponding action on the diseased side. This was, of course, a matter which had been



originally considered. The indication was met with remarkable success, as follows: A piece of rubber tubing, six inches long possessed of an elastic power, adapted to the requirements of the case, was attached by one of its ends to a hair-pin (the ordinary pin used by ladies in dressing their hair). To its other end was united a piece of strong, delicate gill-net string, and this, in turn was connected to a small strip of flesh-colored court-plaster.

The application of this piece of mechanism—an artificial muscle, let us call it—was made as follows: The plaster was softened and applied to the dead side of the face, as far as possible upon the cheek as would answer the purpose. When applied to the lady, standing before her glass, would excite the contracting muscles into play, and antagonize them by drawing slightly backward the dead side with the artificial muscle, and fix it in such required tension by the pin fixed in the middle of the coils of her hair, the rubber lying entirely concealed by such coil. When applied, only the plaster could be seen, the string being hid by the hair.

This rubber muscle answered its purpose admirably. The fear that the plaster would irritate, and, perhaps, inflame the skin seems to have been without foundation. In any rate this held good for six months of use, which was as long as I was able to have oversight of the case, the patient living in a distant city. Should, however, this accident have supervened, it was evident, after a very few days of experience, that a fashion or habit might soon be attained of accomplishing the same object by the use of the plaster applied in such common manner as not to elicit attention.

The result of this operation, the only one of the kind I have performed, has given results which I think warrant its repetition.—*Medical and Surgical Reporter.*

## MONTHLY SUMMARY.

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*Speaking and Singing without a Tongue.*—In the transactions of the Philosophical Society, published between 1742 and 1744, there is an account of Margaret Cutler, who, when four years old, lost her entire tongue from a cancerous affection; but who, nevertheless, afterward retained the power of taste, swallowing and speech, without any imperfection whatever. She not only spoke as fluently and with as much correctness as other people, but also sang to admiration, articulating with distinctness all her words while singing. What is not less singular, she could form no idea of the use of a tongue in other persons. This remarkable case was brought before the Royal Society, under certificates of attestation from the minister of the parish, a medical practitioner and another respectable citizen, well-known in Suffolk, where she resided. On account of the extraordinary character of the case, the society requested an additional report upon the subject, and from another set of witnesses, named by the society for the purpose, and for whom they drew up the necessary questions and marked out the proper course of examination. The second report coincided with the first in all particulars, and shortly afterward the young woman was brought to London, where she confirmed the account by personally appearing, and speaking and singing in the presence of the members of the Royal Society and many other persons.—*The College Courant. Boston Medical & Surgical Journal.*

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*Pernicious Effects of Mercury Prevented by Sodium.*—The pernicious effects of mercury on the general health of workmen employed in mirror factories is well known. According to recent observations the vapor of this metal is as injurious as its dust. M. Crooks has discovered a means to reduce the deleterious action of the mercury dust; it is only necessary to add to the mercury one-half per-cent. of sodium. This improvement has already been tried in a few factories with the greatest success, and we would recommend manufacturers of mirrors to work their mercury with the addition of the aforesaid proportion of sodium.—*Medical & Surgical Reporter.*



*A Case in Surgery a Hundred Years Ago.*—The following interesting case is reported to us by the venerable Dr. E. Alden, of Randolph, Mass. The notes were furnished by the widow of Dr. Baker :

John Stetson, aged thirty eight, farmer, also accustomed to slaughter cattle, July 19, 1868, in a paroxysm of insanity, hid himself in a lonely place near a swamp, and with a knife made a cæsarean section of his own body, ripping open from sternum to pubis. As soon as the deed was done he came to himself, but could not make his cries for assistance heard. He rolled himself about among the leaves in agony ; made also fruitless efforts to reach a neighboring spring, crawled upon the ground and dragging his bowels after him. At length he became exhausted and probably fainted, and thus the bleeding was staunched ; so he remained during the night.

In the morning he was found, and life not being extinct, was placed upon a straw bed and that upon a bier prepared from the burying ground, and so conveyed to his house.

Dr. Moses Baker was in attendance, and first bathed the protruding bowels in warm milk and water, carefully cleansing them from the dirt and leaves with which they were covered, and then carefully replaced them within the cavity of the abdomen, securing them with sutures, compresses and a bandage. He watched over his patient with intense assiduity, making frequent visits. By his request Dr. Joseph Warren, a distinguished surgeon, who afterwards fell in the service of his country at the memorable battle of Bunker Hill, saw the case, but made no change in the dressings, kindly saying that he could not have dressed the wound more skilfully himself.

On examining the account books of Dr. Baker, now in my possession, I find the last charge for attendance and dressings on the twenty-fourth day of August, thirty-six days after the injury. On the twenty-sixth there was a charge "for a consultation when it is to be presumed the wound was so nearly healed that it need no further surgical attendance. The recovery was rapid and the patient was able to labor in the same manner as before the injury. He lived afterwards forty three years, until 1811, when he died at the age of eighty-one.—*Medical and Surgical Reporter.*

*Hydrate of Chloral.*—"The hydrate of chloral, about which so much has been written during the past year, has now reached the stage of a quack medicine, and, in the hands of designing or ignorant people, is likely to occasion much mischief. It is sold in fluid form as an anodyne, mixed with gum or sugar water glycerine, or some tincture, and as the strength of the preparation is not given and it is liable to undergo spontaneous decomposition, the patient can never tell how much of a dose he is taking. A bottle of chloral, put up in the usual style of a popular medicine, which was sent to us six months ago for examination has entirely decomposed, and it would be dangerous to use it, as the nature of the products of decomposition are well understood. We must utter a note of warning that it is never safe to take the hydrate of chloral unless freshly prepared and upon prescription of a physician. It is a valuable hypnotic medicine, but is not to be trifled with."—*Scientific American*.

*The Effect of the Use of the Sewing Machine* on the health has been investigated by M. Decaisne, of Paris, by observations on 661 work-women. He concludes that "the effects on the locomotor system do not differ from those of excessive exercise of certain limbs to the exclusion of others;" that this form of labor creates no special tendency to indigestions, or uterine affections; and that the machine involves no more danger to health than the needle,

The London Medical Press and Circular supports these conclusions by testimony received from manufacturing districts in England—stating that the sewing machine women suffer less than those laboring in cotton mills and weaving establishments.—*Michigan Univ. Medical Journal*.

*Poisoning from the External use of Carbolic Acid.*—A patient in the Montreal General Hospital had suffered for some five weeks with an acute attack of eczema, affecting the entire cutaneous surface. As all other remedies had proved ineffectual, an ointment of carbolic acid and lard, one part to four, was applied to the arms and thighs. An hour and a half after application the patient was found apparently moribund. Prompt cleansing of the surface, and the internal administration of stimulants, by the mouth and rectum, restored him. In five hours afterward, free vomiting took place, the vomited matter

having a strong odor of carbolic acid. Upon recovery the patient stated that a few minutes after the application of ointment, he realized "a peculiar burning, pricking sensation over the whole body," accompanied by extreme vesication, and then followed a state of perfect insensibility.—*Medical Journal.*

*Oil of Peppermint as a Local Anæsthetic.*—Dr. A. W. writes to the editor of the *Lancet* (Nov. 19, 1870,) that "years ago I became acquainted with the fact of the [Chinese,] when suffering with facial neuralgia, using peppermint, which they lightly applied to the seat of pain with a camel-hair pencil. Since then, in my own practice, I have in the same way frequently employ oil of peppermint as a local anæsthetic, not only in neuralgia, but also in gout, with remarkable good results; indeed, the relief from pain I have found to be almost instantaneous."

It is worthy of note that some Chinese pharmacutists in San Francisco and New York have been selling a remedy for neuralgia, which has gained some repute. It is a liquid put up in very small vials, holding about half a drachm each, which is sold at an exorbitant price. The liquid has a strong smell of peppermint, and is in all probability the oil of that plant.

*Hydrate of Chloral and Morphia in Tetanus.*—Dr. Gronow has published the case of a man of forty-four, who suffered from tetanus in consequence of a shot in the chest. Chloral alone did not relieve the spasms, but when morphia was given with it, improvement was manifest. The prescription was as follows: Hydrate of chloral, 150 grains; hydrochlorate of morphia, 10 grains; distilled water and simple syrup, of each two ounces; the fourth part night and morning. The man recovered.

*Poisonous Indelible Ink.*—There is in the market an indelible ink which, when it comes in contact with the skin produces eruptions and inflammations, and is very dangerous to life. The chief constituent of the ink is a black, half fluid resin obtained from the oriental anacardium nut. The ink is brown, and has an ethereal odor; in this respect it differs from ordinary indelible inks, and may be distinguished from them.—*Med. & Surg.*

*Rapidity of Mental Transmission in a Nerve.*—Professor Heilmoltz has made some new measurements on the rapidity at which excitation is propagated along the motor nerves of man from the brain to the muscles. The ascertained rapidity of the excitation varies between 260 and 292 feet per second, and the rapidity is also found to be greater in summer than in winter. This result led us to a more exact observation of the influence of temperature, which is ascertained by the artificial cooling or warming of the arm. By this means the accelerating influence of a higher temperature has been clearly determined, so that the interval of time between an impulse of the voluntary lower and the corresponding movement of the muscles is greater in winter than in summer.—*Medical and Surgical Reporter.*

## EDITORIAL DEPARTMENT.

*Southern Dental Association*—The Third Annual Meeting of this Association, will be held in Charleston, S. C., on the second Wednesday in April next, and promises to be a highly interesting one to the profession.

While a cordial invitation is extended to all members throughout the country, it is to be hoped that the number of delegates from the South will be larger than ever before, as this Association is intended more especially for the benefit of Southern dentists.

The following are the officers for the present year:

Dr. James S. Knapp, *President*; Dr. F. Y. Clark, *1st Vice-Pres.*; Dr. E. A. Herman, *2d Vice-Pres.*; Dr. L. E. Edmunson, *3d Vice-Pres.*; Dr. W. N. Morrison, *Corresponding Sec'y*; Dr. Jno. G. Angell, *Recording Secretary*; Dr. W. G. Redman, *Treasurer.*  
*Executive Committee*, Drs. J. B. Patrick, J. Taft, A. C. Ford, W. S. Chandler, and Sam'l Rambo. *Committee on Membership*, Drs. W. G. Redman, A. F. McLain and F. Y. Clark. *Committee on Publication*, Drs. A. F. McLain, C. L. Thurber and F. H. Knapp. *Committee on Dental Education*, Drs. J. P. H. Brown, F. J. S. Gorgas, and Wm. Reynolds. *Committee on Physiology and Surgery*, Drs. J. Taft, Wm. H. Morgan and W. T. Arrington. *Committee on Histology and Microscopy*, Drs. S. P. Cutler, W. N. Morrison and Jno. G. Angell. *Committee on Dental Chemistry*, Drs. J. G. McAuley, W. H. Burr, and E. M. Allen. *Committee on Dental Therapeutics*, Drs. F. Y. Clark, G. J. Freidrichs and H. Marshall. *Committee on Operative Dentistry*, Drs. W. H. Morgan, R. N. Laurence, and W. H. Shadoan. *Committee on Mechanical Dentistry*, Drs. C. E. Kells, J. R. Walker, and H. Laurence. *Committee on Dental Literature*, Drs. F. J. S. Gorgas, J. P. H. Brown, and B. F. Arrington. *Committee on Voluntary Essays*, Drs. W. S. Chandler, L. E. Edmunson and L. G. Holland.

*Baltimore College of Dental Surgery.*—The *Thirty-first* Commencement of this institution, will be held at the *Co. Opera House*, on Thursday evening, March 2d, 1871. Alumni and friends of the College are cordially invited present, without waiting for special cards of invitation. The Valedictory address will be delivered by Prof. T. Bond, M. D.

*Ready Rubber.*—In reply to numerous inquiries concerning this preparation, and also of its modification, as the terms upon which they are offered to the dental profession we publish the following paper prepared by Dr. Sam'l S. who has spent much time and money in the employment of counsel and experts, in trying to find out if there was any reliance in the Goodyear and Cumming's patents, or any merit in the "Ready Rubber" for dental purposes:

"I understand the "Ready Rubber," which heads Mr. J. Herbert's circular, to be a patented compound material substance, consisting of caoutchouc, turpentine, sulphuric acid, and a mode of treating these ingredients, as described in J. Newbrough's Patent of March 1, 1870, numbered 100,412, designated as "a new process for hardening Rubber with a substance known as Acid Resin."

The circular states that this compound "is furnished vulcanized hard, and can be remelted and moulded in any form, and as soon as cold is perfectly hard."

The license offered to dentists is to "use said rubber manufactured under said patent."

Of what constitutes the "modification of the above," mentioned in the same circular, I have no knowledge beyond a statement made to me by Mr. Herbert, that it is a mixture of Whalebone and Ready Rubber; but as it requires vulcanization by the dentist, "the same as Whalebone Rubber," it is a different preparation from that for which they offer a license.

I have had submitted to me, and have examined and compared in the presence of their representative, what were called of "Ready Rubber."

The result of my attention to the subject is, that I have yet seen a specimen of the product fit for dental uses. These were the specimens of mixed Whalebone and Ready Rubber, called a "modification," furnished by Mr. Herbert, fit for dentists' use. They are confessedly unfit; but they promise to be good.

In regard to the terms proposed: they ask from dentists apart from, or in addition to, a higher price for the material.

license fee or purchase of office right, during the term of their patent. By this I understand that the sum named for "office right" is the price of their guarantee and protection.

The license grants a right "to use the said rubber manufactured under said patent," but it does not grant the right to use said patent in making Ready Rubber should they fail to supply it.

This has to my mind the same objection that obtained against the Boston Dental Vulcanite Co.'s use of the license system to a degree certainly oppressive, and by many considered as taking an illiberal and unjust advantage of their necessities.

Regarding the promise to "defend" their licenses, and their responsibilities on that promise; I do not know who are "the owners of said patent," and neither circular nor printed license binds the owner or gives any information on that subject. I note particularly, however, that while their license binds the dentist not to defend any suit brought against him for the use of their rubbers, they leave him without recourse or guarantee if they default or are defeated, and personally liable for costs and damages.

That the owners of the Goodyear and Cummings patent will attack just when it suits them to do so; that they will not consult the interest or convenience of the "Ready Rubber" party, or of those working under their license, there can be no doubt. In addition to this, I think—as their standing in court now is—that the owners of these patents can get preliminary injunctions at once against any dentist using any "Vulcanized Rubber," or constructing a plate of material requiring similar processes. Whether the "Ready Rubber" party will promptly defend; whether they will succeed in that defence; or whether their "guarantee" and protection will prove efficient, time alone will determine, as it will also determine the qualities, of "Ready Rubber," and the "Modification" of it, and their fitness for dental uses.

Therefore while it would afford me great pleasure to announce an article of equal value to hard rubber, free from the illiberal exactions and offensive modes of settlement that have caused the Boston Dental Vulcanite Company, represented by Josiah Bacon, to be a stench in the nostrils of the dental profession, and hating even in this indirect manner to aid the continuance of their exactions, I am extremely sorry that a long and careful investigation leaves me without confidence that any relief can be found in this direction."

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*Extraction of Artificial Teeth and Metallic Plate from the Esophagus after Eighteen days' Impaction.*—The following interesting case occurred in England, and is described by the *Lancet* as follows:



Emma N——, aged twenty-five, whilst in bed on Christmas eve, dreamed that she was swallowing something and on waking discovered that three artificial teeth fixed in a plate of silver and platinum had disappeared from her mouth. She experienced no difficulty at all in breathing. She could swallow any solid food, the attempt to do so producing a sense of sickness; but beef-tea, milk, and broth she found no difficulty in swallowing.

The patient was brought into the operating theatre on the 11th inst. Mr. Walton passed a pair of long forceps without meeting with any obstruction. He then passed an œsophageal bougie for the purpose of exploring. The instrument entered the stomach, but grated against something in its passage through the tube. The bougie on being withdrawn showed some resistance caused by some foreign body. Judging from the upper part of the scratch, the object must have been in the œsophagus, at a point opposite the insertion into the sternum between the third costal cartilages. The scratch itself measured 1½ inches in length, and there was about the same distance from the lower part of the scratch to the point of the bougie which touched the patient's lips during the exploration. Mr. Walton then passed a hooked probang, and caught hold of something that appeared to have a sharp edge. He then withdrew the object slowly and carefully to avoid lacerating the œsophagus. When he had been brought to the upper part of the pharynx, the patient made a sudden gulp, and swallowed it again. Mr. Walton then seized a pair of long, curved forceps, and, introducing them into the œsophagus, grasped the artificial teeth, and recovered them and the plate. No loss of blood ensued, and the patient showed only a slight reddish tint in the mucus which the patient spat out.

Although the metallic plate had been out of order for some time previous to the accident, the patient had never taken the precaution of removing it at night. It held three teeth in a half of its irregular convex edge. Its entire length was 1½ inches and the greatest breadth 1 in.

As the operation produced pain, and there must have been more or less tearing of the œsophageal surface, Mr. Walton deemed it advisable that the patient should, for a time, take food by the mouth. For the first four days she therefore received enemata of six ounces of beef-tea; for three days more the quantity increased to eight ounces, and administered every five hours. They were all retained. She then began to take liquid food and shortly afterwards was placed upon full diet. She remained in hospital quite well, and without any appreciable loss of strength or flesh.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.      THIRD SERIES--MARCH, 1871.      No. 11.

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ARTICLE I.

*Valedictory Address.*

Delivered at the Thirty-first Annual Commencement of the Baltimore College of Dental Surgery, by HENRY CABELL JONES, D.D.S., of the Graduating Class.

LADIES AND GENTLEMEN :—Conforming to a custom, the present graduating class of the Baltimore College of Dental Surgery have selected one of their number to represent them in their commencement exercises, and I have the honor to address you in that capacity.

Many years will have to run their course, ere the remembrance of the earnestness of your good wishes and approval, manifested by your presence here to night, and the oft repeated kindly attentions which we have received at your hands, will be erased from the tablets of our memories. To-night we meet together for the last time, for it is not in the course of human events that we shall ever meet again, and our parting will be one in which sad and joyous emotions will be so intimately blended, that it will be difficult to strike the balance between them. Painful indeed will it be to sever the fond associations which have entwined themselves around us ; sad indeed to part from the many friends made during our sojourn in this beautiful city. But joyous in another view will be this parting, for in a few shor



hours we will have arrived at our homes, have received by the loved ones who have fondly hoped earnestly prayed for our safe return, and as a recompense for our separation, we will be able to place in their hands the certificate of having performed our duty this winter. We can say with honest pride that we have received our passports into active professional life, and may indulge with trust that with their assistance, we will never cease our efforts to attain that skill in the practice of our profession which will enable us to command the confidence of the communities in which our several lots shall be cast.

Dear friends, we truly appreciate the many evidence of the earnestness of your good wishes and approval manifested here to-night, and we would have one and all extend to you the warm hand of friendship, feeling sincerely thankful for the heartiness of your encouragement.

*Respected Gentlemen of the Faculty:*—Words cannot express our gratitude to you for the faithful, untiring manner in which you have instructed us in the fundamental truths of our profession, for the principles which you have instilled into our minds, for the kind forbearance with which you have borne with us, for the words of encouragement which you have spoken; when well nigh discouraged, almost despairing, you have bidden us hope. Never will we forget with what cordiality you have at all times received us, treating us rather as sons than as students. As a recompense for our past study, we have to-night received at your hands our diplomas as Doctors of Dental Surgery, and now as we bid adieu to the lecture room and pass out into active life, our strongest bond of obligation is so to acquit ourselves as to receive your approval. We crave no higher boon, than that you may never regret the confidence which you have this night reposed in us, and that you may look with pleasure upon our prosperity and success. The relations existing between teacher and pupil, akin to that of father and son, are amongst the most lasting in life. The gloom of sadness settles upon our brows when we realize that these are

parting words, that associations so pleasant and profitable are to be severed, and we would not leave you without making known our thorough appreciation of your efforts, nor have you remain ignorant of the lasting attachments which we formed for you individually.

Wherever in the wide world our lot may be cast, and whatever fortune betide, the seeds of truth, good motives and sound principles, which you have so carefully sown in our minds, we trust will germinate and bring forth such fruit as will obtain for us the prize in all contests. May a long life be your portion, may many more be entrusted to your hands for instruction, may you reap year after year the abundant rewards of the faithful laborers, and when the noontide of life is past, end your days in peace plenty and happiness is our most earnest prayer.

And now my *Fellow Classmates*, to you it is meet I should address a few remarks. To-night we, in receiving our diplomas, have that guarantee which admits us to honorable competition with those who have already acquired eminence in the ranks of professional life. Let us ever maintain that self-respect and high moral standard which our profession demands of us; let us beware of all vices, for whoever has a vice has a vulnerable place in the wall of his moral defence; he may be strong at all other points, but though elsewhere locked in triple steel, he is there open to successful attack. The weaknesses of character are the least guarded; the one of vulnerable character feels strongest in that point where he is most open to attack. The suspicious and jealous pretend unusual confidence. The rash and impetuous boast of discrimination and coolness. Cautions are wasted, for vanity makes them deaf and blind; self confidence is not safety, except for those who trust to what is sound, tried, solid, true. Vices grow weak by numbers; virtues stand in serried rank, strong, disciplined, and mutually strengthening; vices are a loose, disorderly, contentious throng, each making the other worse and all combining against the possessor. He whose passions, of

whatever kind, overcome his reason, will see his vice in the garb of virtues. Whether his ruling vice be ambition or avarice, vanity or cruelty, inconstancy or fear, selfishness or procrastination, when he comes to take a sad and sorrowful review of his life's history, he will be able to trace most of his suffering, the worst of his failures, the most serious of his blunders, to his leading vice, or the combined influence of his several vices. He will then see clearly, what he may have dimly seen or only suspected before, that a vice is a defeat of moral vision, distorting persons, objects and facts. He will feel what preceptors could never teach him, that vice takes the senses captive. Let us therefore study closely our characters and when we find a vice, tear it up by the roots and plant in its place a virtue, to present an unbroken phalanx, which our enemies will be unable to penetrate. With a front well watched and fully guarded, we will be able to attain an enviable place in the opinions of our fellow men, and will justify them in saying of us, he is a true man.

"Resolve is what makes a man manliest, not puny resolution, not crude determination, not errant purpose, but that steady and indefatigable will which treads down difficulties, danger, as a boy treads down the heaving frost-laden winter, which kindles his eye and brain with a proud purpose beat toward the unattainable. Will makes men giants; it made Napoleon emperor of kings; Bacon a fathomless nature; Byron a tutor of passion, and the martyrs masters of death;" it will make us masters of our profession. Fellow classmates let us resolve, and resolving perform, no difficulty however great, no barrier however insurmountable, shall make us falter; but ever with the determination to trample under foot all difficulties, to conquer all barriers, let us walk our way in life, that when our pilgrimage on earth is ended and the summons to eternity is received, each of us can say truly, I have performed my duty to God and to my fellow men.

In that supreme hour no reflection will afford us any genuine confidence, any more satisfaction, but this. No success, no public applause, no private aggrandizement will disarm that moment of the most trifling of its terrors, and yet all that clothes it with its most appalling gloom; will disperse as mists before summer suns under the single reflection, "I have done my duty."

"So live that when thy summons come to join  
The innumerable caravan, that moves  
To the pale realms of shade, where each shall take  
His chamber in the silent halls of death;  
Thou go not, like the quarry-slave at night,  
Scourged to his dungeon: but sustained and soothed  
By an unfaltering trust, approach the grave,  
Like one who wraps the drapery of his couch  
About him, and lies down to pleasant dreams."

That this may be the happiness of each of you and of all this audience, is the highest blessing I can invoke as I say "farewell."

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## ARTICLE II.

### *Filling Teeth.*

By E. L. HUNTER, D. D. S.

#### *Filling Superior Incisors on their Labial Surfaces.—*

Acidulated buccal secretions having made their ravages upon this part of the teeth, we proceed after careful examination to prepare the cavity in the usual way, viz: by a thorough removal of decay and so shaping it as to permit us to make the mechanical adjustment of the filling firm and lasting. This can be effected, 1st, by mere shape in the general outline of the cavity; 2nd, by lateral grooves in the dentine, and 3d, by one or more retaining points. If soft foil is to be used, the first or second is the method; if adhesive foil or sponge gold, any of the three will answer, provided however, that in certain localities the third method is particularly called for by the termination of one cavity in another, or condition of the surrounding walls, &c. We do not esteem soft foil the most desirable for this locality, as when best condensed it is still softer than a well made adhesive



filling, and is much exposed to the wear of the brush. I have often seen these fillings so much worn in this way as to prevent the margins of the cavity to be in their proper position, countersunk in the same way, thus rendering the loss of much tooth substance necessary in a repetition of the work. If, however, the work should be done with soft foil, we would prepare the gold, Nos. 4 or 6, in carefully folded strips corresponding to the size of the cavity, i. e. a little smaller than the cavity. These strips should contain no more gold than will permit them to be perfectly flexible under the plugger. We would also prepare a very small strip of No. 20 doubled three times or No. 60 single. Having placed the patient comfortably, and convenient for operation, we carefully cleansed the cavity, provided against further contamination by folds of bibulous paper, some other absorbent, or Rubber Dam, dry the cavity with bibulous paper, flax, cotton-wool, punk or strip of old linen, and finish if desired by evaporating in the cavity a drop of chloroform.

The strip of soft foil (No. 6.) should now be carried to the cavity and have its end laid on and about the cervical wall, then with a hoe shaped wedge and serrated plugger of sufficient width at the point to thoroughly control the gold, the first fold is carried to the bottom of the cavity against the cervical wall, the gold being kept in position by the thumb of the left hand. The inner end of each succeeding fold is successively carried in the same direction, and thoroughly condensed as it is possible to make them by lateral pressure on each fold, being careful to carry them even, one upon or against another without twisting. When the cavity is one-fourth full, the folds should be pushed slightly to the right and left to counteract the difference and make up for the difference between the size of the cavity and the width of the gold. When two-thirds full they are again be placed in as before, and a smaller point of the kind used except that it might be straighter as more pressure will be required in carrying the gold to the bottom of the cavity. If the cavity should be a long groove instead

one nearly round, the same rule or mode of operating will apply to it, provided you commence in the one and repeat the same thing in the other, or else in the middle and repeat on each end. Having introduced all the gold possible this way, we open a hole in the centre having parallel sides or walls, with a sharp wedge, and fill with the No. 20 or 60 strip, using the wedge force in the direction there is reason to believe much pressure is needed. Every other point or part of the filling is now tried with a very small point until it is determined that no more gold is required. A sufficient protrusion having been left (and, if possible, no more) for proper condensation, the ends are condensed from the margins towards the centre, first with large and then with smaller points, and finally with very small points with slight serrations and mallet force.

The marks of the plugger having been rubbed out with a dry burnisher, the filling is filed down to near the contour of the tooth, and recondensed with the mallet, reburnished and the patient allowed to free the mouth. The filling may then be filed down, and have the file marks and overlapping scales removed, first with corundum point, and Arkansas stone, then finished with fine pumice stone and precip. chalk, and soft wood, tape or buckskin. After the use of one polishing powder, and before the use of another the filling should be cleansed. After using the chalk, wash, and use the burnisher with soap. Then wipe dry and rub for several minutes with a hank of dry floss silk, which will relieve the brightness and thoroughly remove or test the small overhanging scales, which are always more or less present though not perceptible to the naked eye.

If the margin of the walls of the cavity shall have been made smooth, firm and well defined, we know of no way so effectual with soft foil as the foregoing, as it was but lately that we have been made acquainted with the happy method of "Combining Cylinders and Crystal Gold."

We would also say that in making these soft fillings, we have sometimes varied from the rule as to condensing, first

with broad points and then with small, by using the small points entirely, when if too much gold has not been protruding, the filling will partake much of the nature of adhesive gold, always take a better finish, and be removed from the cavity with extreme difficulty. This is particularly applicable to gold fresh from the beater, when it is slightly adhesive.

We are taught that heavy gold is valuable in filling small cavities, and it was this which suggested to us its use in filling the hole made in the centre of our fillings. We thought it can there be carried to the bottom, when by our utter impatience we cannot do so with the light No's, as No's 1, 2, 3, 4, and 5.

Before speaking of the manner of using adhesive gold in the locality just spoken of, we have a word to say in relation to the action of this gold under the plugger, and the tendency to draw upon itself, and we do so with a full and enough consciousness of our incapacity to treat the matter with the polished science familiar to experienced operators.

Our own views in this matter are given, not because we would set them up in opposition to those of wiser men, but because they were engendered by that experience of which we are writing. It was our opinion that the tendency of the pellet to draw up under the plugger, was an apparent and not a real one, that the more it appeared to do so, the less it really did; the rolling up of the pellet being occasioned by pressure upon one point, and not occasioned by a simultaneous pressure of its whole surface. If a coin on an anvil be struck in its centre with a hammer, a concavity will be given to the coin, because its centre is increased without a corresponding increase of its circumference, when if the whole surface receives the blow at the same time, its diameter will be increased without any concavity, without drawing upon itself. So if large points are used in introducing the gold, this tendency will be obviated to an extent greater as the point approximates in size that of the cavity. If thus caused to adhere to a preceeding pellet which

adjustment against the walls of the cavity, it cannot draw upon itself when it is condensed with smaller points, and being held down must be expanded laterally, when its whole surface shall have been condensed, as gold is malleable. The expansion will be great in accordance with the softness and purity of the gold and the pressure made. We are speaking of force in the direction of the bottom of the cavity as a principle. Of course there often arise circumstances which require modifications, as for instance retaining points and undercuts as well as irregularities of various kinds which require to have gold pressed directly into them. Undercuts filled in this way will be forcibly held in position by the expansion of the succeeding gold, as is that packed against the walls, as we are taught, by the succeeding "key stone" in the centre.

In filling the cavity before mentioned, with adhesive gold, we commence by filling first the undercuts or retaining points, if the nature of the case shall have suggested making them, and then with a broad pointed plugger overflow them and extend the mass over the entire floor and against the walls of the cavity. In the introduction of each succeeding pellet of gold, we have endeavored so to place them, that as much or more gold would be near the wall than in the centre; in this way, when there is a base to work upon, build around next the wall higher than in the centre, then work enough in the centre to make it higher than the margins and so on until the cavity is full, thus gaining the valuable qualities of adhesive gold, and the expansive force of nonadhesive when the wedge is used, as well as what there may be of expansion of the gold by mere pressure, which has been made directly downward with large and small points.

The cavity being filled is finished as before described.

The *approximal surfaces* of these teeth after separation are subject to the same general rules in filling, except that pressure is made in the use of both kinds of gold towards the cervical wall, at least until there shall be so much gold



in the cavity as that by the approach towards each of the palatine and labial walls, the gold shall maintain its adjustment, the pressure it has received against the cervical walls, when, if using adhesive gold, pressure be made in the direction of the bottom of the cavity, the separation of these teeth, the file, enamel chisel, or slow pressure, or a combination of several of the means as may be suggested by the nature of the case, is to be used. If space is taken with the file or chisel the gap or aperture should generally be on the palatine surface sufficient for convenient approach to the several parts of the cavity. So much might be said of the different methods of separating teeth, that we do not feel called upon to say more about it, except that we should never attempt the separation so far as to pass the points of contact, which means they would again approximate, thus resulting in a return of decay almost certain.

It often happens that the *anterior surface of the first molar* is a seat of decay, in consequence of the decay of the first molar, which is formed and erupted at a period when there is so generally present a disorder in the functions of the body. In January 1870, we were called to operate for a young lady living in the South and aged 25 years. After treating some ten or fifteen carious openings in her teeth, we examined the anterior approximal surface of the first superior molar on the left side and found that decay had encroached so much upon the nerve pulp as to cover at least half of its surface; there were only small islands of enamel on the palatine and buccal sides, and about one-third of the grinding surface was gone. The pulp was in a perfectly healthy condition, as that also of the surrounding teeth, and the patient's health was good. The decay was fully removed and the lining membrane not wounded. The cavity was dried and protected from moisture, and then bathed for a few minutes with carbolic acid, when the cavity was filled with *os-artificiel* and evaporated on its surface a drop of liq. gutta percha, when after a space of three

hours I carved down the filling to the proper distance to enable me to make a good gold one, and filled with Watt's Crystal Gold, with mallet force. No inconvenience has since been felt and the tooth has every appearance of having all of its original vitality.

In June 1870, we operated on the same tooth in the mouth of a younger sister, about 19 or 20 years of age, decayed in the same place and in the same way, except that neither the nerve pulp nor the lining membrane were exposed. The tooth was extremely sensitive and the decay was removed with great difficulty. When prepared for filling it was so extremely painful that the patient could not tolerate the contact of any metallic substance on the bottom of the cavity; and it was so shallow that none of the usually servicable non-conductors could be used. It was bathed for some time in creosote, and then having saturated a small piece of letter paper with creosote, I placed it on the bottom of the cavity and filled with crystal gold, with comfort. This method was pursued because the patient wished to be absent from home for some months, and we did not think that the conditions of the fluids of the mouth would warrant a temporary filling. I had to choose between the loss of the tooth from absorption of a temporary filling, or of inflammation produced by thermal shocks conveyed through a metallic filling. I endeavored to choose a safe course, but was not successful. The patient lost the tooth about one month afterwards, while away from home from severe odontalgia.

I do not yet know what I ought to have done, and I gained neither success or wisdom, unless it be the latter. Hereafter I will pursue an expectant course in such cases, and if the patient does not or cannot return at a proper time, it will not be my fault at least.

## ARTICLE III.

*Report on Operative Dentistry.*

Read before the American Dental Association.

By Geo. H. CUSHING, D. D. S.

*(Concluded.)*

It is not claimed in this report for heavy foils that they greatly facilitate operations; on the contrary, in most cases it is thought that more time is required than with light foils, but a far higher claim is made for them, viz: that they enable the conscientious practitioner nearer to the goal for which he is striving—perfection in his operations.

No man who desires to secure the highest results in his art can rest contented with old methods until he has given his patients heavy foils a thorough and impartial trial.

Before leaving the subject of changes and improvements in the methods of performing operations for the removal of salivary calculus, and of polishing teeth, the importance of which is daily becoming more and more recognized by the profession, and the manner of performing which is receiving a degree of attention more in accordance with its importance than formerly.

A marked advance has clearly been made in this direction both theoretically and practically, and has been much aided by the improved and delicate instruments which have more recently taken the place of the old fashioned clumsy forms which were illy adapted for the work. In certain cases the rubber dam comes in as a most important and indispensable aid to complete thoroughness. In fact progress is the watch-word of operative dentistry in its details. But the already extreme length of this report precludes any further elaboration of minor details, though a chapter might appropriately be devoted to the operation of pivoting teeth.

Under the head of materials used for filling teeth, the preparations of gold will be considered. Of Watts' gold it is unnecessary to speak; its reputation is full,

lished, and though having comparatively few advocates, yet it is unquestionably true that very superior and durable operations may be and are made with it.

Brief mention will be made of such preparations of gold as are in any sense new, within the period which this report proposes to cover. The preparation known as "Morgan's Plastic" and "Lamm's Shredded" gold are those most noticeable, as although they are among the things that are past as far as occupying a prominent position before the profession is concerned, they deserve notice here for the brief hour of triumph they enjoyed, and also because in the case of the "plastic" it still fulfills certain indications better perhaps than any thing else.

The first of Morgan's plastic gold which was offered to the profession was better than any since manufactured, and seemed to give promise that better results might be hoped for from its use by the general practitioner than had been previously attained by the use of foil. Experience, however, soon demonstrated that for general use it was not as reliable as foil, while the deterioration in quality, which was soon observed, forced some of its warmest advocates early to abandon its use. The unwise advocacy of some of its earliest friends in the promises held out by them of extraordinary facility and rapidity of operating which might be attained by its use, encouraged a degree of carelessness in its application which was reprehensible and unfortunate to the last degree. The inevitable consequences of this soon became apparent in rapidly disintegrating fillings, and the speedy recurrence of decay at the margins of others which apparently remained intact.

It can hardly be doubted that much more harm than good resulted from the introduction of this form of gold. And yet very fine operations were made with it and can be still. There are in existence operations which were made with it when it was first introduced that will compare very favorably with the best then made with foil. These, however, were obtained as all first class operations are—by thorough

ness and care and time—skillfully bestowed. But not be doubted that the use of foil secures less disastrous results in general practice than any form of crystal gold.

The plastic gold, however, is in some cases of great advantage still, as in the case of certain cavities whose walls are necessarily left concave, and where difficulty is experienced in making secure anchorages by retaining points. In such cases advantage can be taken of the quality of this gold which admits of its being packed upon such a surface without rocking, thus enabling the operator to secure a firm base for his filling more easily than could be done with foil, after which the filling can be completed with foil.

Of Lamm's gold it may be said that it never was so popular as Morgan's, and the same general objections to Morgan's apply also to this, and its use was always more limited and is now believed to be exceedingly small.

Of the different qualities of foil there is not very much to be said; very many manufacturers making a superior quality, each having his especial advocates among the profession.

Of the light foils mention may properly be made of the corrugated foil, manufactured by R. S. Williams, of New York, as being new, in that it was corrugated. For some time it seemed to work more satisfactorily than the foil of the same manufacturer which was not thus prepared. With many operators this was and is a very favorite style.

Of the heavy foils the same general remarks apply. All first class manufacturers make a good article, and only make which it would be proper to distinguish from others in this report is the rolled gold.

This unquestionably possesses in a greater degree than any other foil the requisites of a perfectly cohesive filling, is, softness, pliancy, toughness and cohesiveness. This is naturally be expected in a foil which is not produced by hammering, the latter process depriving gold to a great extent of the qualities above enumerated. Another kind of heavy gold has quite recently been introduced, "Eureka," made by Mr. Pack. This has not been in vogue

enough to warrant this report in speaking particularly of its merits, but theoretically it ought to possess the requisite qualities in a high degree, as it is understood to be produced by rolling, though with some modifications of the process as followed by Mr. R. S. Williams, the manufacturer of the rolled gold first alluded to. Whether these modifications tend to improve the quality of the foil is not known, and experience only will determine. It may be remarked in closing this reference to materials, that, properly manipulated, any heavy foils of first class manufacturers will produce the highest results attainable with any form of gold.

Under the head of appliances introduced tending to render operations both more simple and more nearly perfect, it is the duty and pleasure of this report to name as foremost of all such appliances the "rubber dam."

In June, 1864, at a meeting of the New York Dental Society, Dr. J. W. Clowes, in behalf of Dr. S. C. Barnum, of New York, formally presented to the profession as a free gift, this improvement, which had but just previously been devised. It is not too much to say that Dr. Barnum gave to the profession in the "rubber dam" the greatest single invention towards perfecting the operative department of dentistry that has ever been given to it since the commencement of its history. And it is but proper that this report should pay the just tribute of thanks to the author of so valuable an improvement for the manner of its presentation to the profession. It comes without fee or royalty, a gift laid in a true professional spirit upon the altar of science! What higher praise could be spoken?

It might be deemed inappropriate that such words should be spoken here; but when it is considered how very rarely such an opportunity presents itself for such acknowledgment, the propriety of this public recognition of an act of generosity handsomely performed must be conceded.

The introduction of the rubber dam may be said to have inaugurated a new era in the practice of operative dentistry.

It renders possible the performance of operations without its aid, could never be performed. It simplifies all operations which under skillful hands were possible but only possible under great embarrassments, and on the part of the most skillful in the use of those means which were known for excluding moisture from cavities to be filled. It simplifies all operations in which it can be applied (and it is in almost every case) by securing immunity from moisture, thus relieving the operator from all anxiety on that score, enabling him to concentrate his attention upon the operation exclusively, and to give all the time necessary for its most thorough performance. In the preparation of root cavities, a free observation of which is obscured by too great a flow of saliva, or by blood in cases where the cavities tend below the margins of the gum, the dam is almost indispensable, and is of essential service where continued applications are required to cavities for the purposes of bleaching or medication.

It is valuable, also, in many cases in the performance of operations for the removal of salivary calculus and of superficial decay. Enabling the operator in the first case to remove minute particles which would otherwise escape observation, and in the other case to more thoroughly examine the surfaces of the teeth affected with disease.

Its value is inestimable, and no man who desires to secure the highest results and to most largely benefit his patients can afford to be without it.

Unfortunately its use is not as universal as it should be, mainly because of the seeming difficulty of its application to beginners. Many are discouraged and do not persevere because they fail to apply it successfully and easily at the first few trials; but no man should rest satisfied until he has mastered the manipulations necessary to its successful application. There is nothing in the details of practice which will so well repay the operator to acquire the knowledge necessary to the proper application of the "rubber dam."

The nearer approach to perfection in the manufacture



instruments, particularly of pluggers, which has been attained quite recently, and the many admirable forms which have been introduced to the profession by various operators during the last few years have contributed materially towards the improved practice of the present day. Of these, the set known as "Varney's pluggers," manufactured by S. S. White, deserve especial mention for their admirable form and the very superior manner of their manufacture and finish.

One of the most admirable inventions tending to lessen and render more perfect labor in this department has been laid before the profession during the past six months, in the shape of a "Pneumatic Burring Engine," the invention of Mr. G. F. Greene, of Kalamazoo, Mich., a gentleman not of our profession, but an inventor to whom the profession are largely indebted, not only for the instrument itself, but for the demonstration it affords for the practicability of the application of the mechanical forces to instruments to be used upon the teeth. This instrument, as its name indicates, is operated by air, which is drawn through a chamber in which are placed the rotating arms which give motion to the elongated shaft running from this chamber. In the end of this shaft are to be fitted, as required, burrs of various shapes and sizes.

The motion is very rapid and uniform, rendering the instrument entirely manageable. The purpose of this instrument is to lessen the labor of, and secure greater perfection in the operating of burrs and drills, both for opening cavities and for finishing fillings. It works admirably for both these purposes, and the ease and rapidity with which a large filling may be dressed down and the perfection of the operation when effected with this instrument, must be witnessed to be appreciated.

There is also an attachment by means of which drills and burrs may be used in the reverse direction, or at any angle from the main shaft, thus enabling the operator to shape more satisfactorily and easily certain cavities upon the pos-



terior of molar teeth, and to make retaining pits which out some such apparatus could never be affected. I believe that this is the first instrument proposing to use drills and burrs at different angles ever invented, and could be said to be at all of practical value. There is an attachment for carrying a file which is in some degree of utility. But the great merit of the instrument lies in its admirable operation in opening cavities, burring off decay and removing superficial decay in places otherwise inaccessible.

The instrument must take rank as among the most useful which have ever been offered to the profession.

Another instrument working upon an entirely different principle, but aiming to secure the same results, has recently been invented by Dr. J. B. Morrison, of St. Louis. It has not been sufficiently tested by the profession to have acquired any reputation, but from what the committee has seen of its operation in the crude and imperfect apparatus exhibited, they are inclined to think it has some points of merit which in a perfectly constructed machine would make it superior to any other yet proposed.

In the introduction of the mallet for condensing amalgam a long step in advance was made, and it has steadily been growing into favor, until now it is rare to find an operator who does not use the mallet in some form, either the hand or automatic.

The first mallets introduced were quite light and made of elastic material, either wood, hard rubber or ivory; but experience has demonstrated the superiority for general use of a heavy non-elastic mallet.

About four years since the leaden mallet, weighing six to eight ounces, was introduced to the attention of the profession by Dr. Forbes, of St. Louis, and has been in general use at the West for nearly three years past. Recently it has attracted the general attention and is coming more and more into favor daily. Doubtless it will be universally adopted.

Its great merit consists in its being less objectionable to the patient, while it is easier for the assistant to use, requiring less care and skill to insure an effective blow.

The philosophy of this would seem to be found mainly in the fact that heavier bodies moving at lower velocities, diffuse their force more throughout bodies struck than is the case with lighter bodies moving at high velocity, in which case the blow is struck so quickly, and the force imparted in like manner, that there is not time for it to be diffused to any extent beyond the tooth. The force in this is as it were concentrated upon the tooth and its immediate surroundings. This would seem to be the explanation why the heavy leaden mallet is less disagreeable as a rule than the lighter elastic one.

Of course there are cases in which the light mallet will be preferred, and there are certain cases in which a heavy *soft rubber* mallet will be found much less disagreeable to the patient than any other. Strange as it may seem, the soft rubber mallet condenses the gold very satisfactorily, and for burnishing is much more effective than any other, as a much heavier blow may be struck with it with less discomfort to the patient.

From experiments made regarding the action of different materials as mallets, the soft rubber would seem to possess equal *vis viva* with the lead or *lignum vitæ*, while the diffusion of force in the case of the rubber closely approximated that of the lead. This again appears very strange in the light of experiments referred to, as the elasticity of materials of a hard texture seemed clearly to be the chief influence lessening the diffusion of force, while the rubber a more elastic material than wood, shows a greater diffusion of force than lead.

These facts are mentioned as being curious, not with any view to attempt their philosophical solution.

Practically we must learn by experiment in the mouth what is most desirable to use, and it is confidently affirmed that careful experiment will establish the superiority of the heavy leaden mallet for general use.

With reference to automatic pluggers it may be remarked that most of them operate upon similar principles, and for certain purposes and cases they are very available in fact valuable, but that nothing has yet been perfect in that line which successfully takes the place of the mallet intelligently and skillfully used by a competent assistant. The nearest approach to this has been made in the "automatic mallet," invented by Mr. G. F. Greene, of Kalamazoo, but this is very far from perfect yet.

A pneumatic mallet, invented by Hyde, as supposed of which W. H. Jackson & Co., of Ann Arbor, are proprietors, gives promise of a nearer approach of what is desired but as at present constructed and operated can be said to possess but little merit. It seems unfortunate that its proprietor or inventor is unwilling to take the advice of experienced men in the profession, and endeavor to improve the instrument, for it is believed that within it are folded the elements of success, and that if fully developed the instrument might become a very valuable one, even though it does not entirely supplant the hand mallet.

A want has long been felt by the profession of files of quality and proper shapes for the more thorough finishing of fillings and of roughened surfaces of the teeth, where the sort has been had to the file either for the purposes of removing superficial decay or of prophylactic treatment. In this report it would seem proper to refer to the source from which such superior files may be obtained. These files of a great variety of forms and of very superior quality and fineness of cut, are manufactured by Vautier and by Baur & Fils, and can be obtained of G. A. Huguenin, 64 North St. New York.

In submitting this report your committee do so with a realizing sense of its many imperfections, but in the belief that the most prominent feature of change or improvement in methods of practice, in materials used and instruments and appliances introduced, tending toward improvement and simplification of practice, have been fairly stated. Of course

it would be impossible in such a report, which already exceeds reasonable limits, to follow out in detail all the steps of progress.

The conclusions arrived at in the discussion of subjects must necessarily largely reflect the individual views of the writer and the other members of the committee; but the endeavor has been made in dealing with all these points to reflect the general view of the profession, so far as it could be ascertained in matters of practice, and as to experience regarding methods which are to a large extent occupying debatable ground.

The consideration of the influences tending to modify this department of practice should naturally be treated of in a report of this character, and it was hoped that one member of this committee would have undertaken that task; but such not having been done, your indulgence is asked for the briefest mention only of some of the main points which seem prominent among such forces, that their mention may perchance suggest thought and stimulate to greater activity the already largely progressive spirit of the profession. The influences tending to progress are to be chiefly found in an ambition to excel, a desire for distinction, and a wish for the greater benefit of humanity.

These impulses when controlled by that higher and holier spirit, the possession of which alone would entitle a man to the distinction of being considered truly professional, must eventually result in the highest degree of human attainment.

When, however, these holier ends are subordinate to those of personal ambition and selfish gain, they are materially dwarfed in their possibilities for good. Happily the spirit of unselfishness is growing in the profession, and there is cause for congratulation thus far and greater hope for the future.

Of influences tending to retard improvement, may be mentioned the ignorance of the public touching the mutual relation existing between the profession and themselves, which is most prominently evinced by their unwillingness

to recompense justly the highest order of professional attainment, and which finds support and encouragement in the willingness of many members within the ranks of the profession to pander to this spirit, not of illiberality, but rather of unjustness, born of ignorance.

The force of such influence is very great. If "man cannot live by bread alone," it is certainly essential that he have bread, and the temptation under the pressure of necessity to accommodate practice to low demands, rather than to try to educate the public to an appreciation of that which alone ought to be done—the very best in all cases—is so great that many men having the possibilities of greatness latent in them, keep those innate powers hidden at the expense of their patrons and of their own higher development.

It may be broadly asserted that no man should remain in the profession one moment after he ceases to command a just or sufficient recompense to enable him to render to his patients the highest professional skill within his power to give. Our motto should be "Excelsior;" but placed as it is, that should be "for the love of God and humanity—a conscientious discharge of our duty." When this high principle controls our profession, we shall see more gigantic strides made in the progress of our science and art, and we may be sure that after we are gone from our present field of labor, our successors will rise up and call us blessed."

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## SELECTED ARTICLES.

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### ARTICLE IV.

#### *The "Pyroxyline" Base for Artificial Dentures.*

The material is cotton fibre, decomposed with ether, so that it is not explosive, but combustible at about three hundred degrees Fahrenheit. Hence its name, Pyroxyline. It has the strength, texture, and appearance of translucent paper, but is more compressible. It is not at all affected by the secretions of the mouth. Raised or pressed between two

a sissing heat, under a severe pressure, it readily takes and retains the form of the dies. Parts or pieces are readily united by applying to surfaces in contact, ether of the proper strength. If the ether be pure (as is Squibs'), one-third alcohol must be used. All other is uncertain, and is to be tested before trusted. To unite the teeth, filings from the plate, or other like material, are used as a solder; and in all cases the eye must witness an actual solution; the grains or filings must be lost, and a homogeneous lustrous appearance taken on.

But this material, being wholly or partially dissolved, shrinks more than a hundred per cent. in drying. Hence its manipulation throughout, must be treated with reference to this fact. Properly manipulated, its shrinkage is made useful instead of hurtful. The plate never tarnishes, nor will the filings, if the following rules be well observed:

*First.* The filings must be clean, fine, and free from all admixture, except a very little vermilion.

*Second.* They must be thoroughly dissolved, so as to assume a clear translucent and waxy appearance.

*Third.* They must be very thoroughly packed or pressed together, while setting or hardening, to prevent porosity.

*Fourth.* The piece must never be put in the mouth, or in water, until the ether is entirely dried out by a heat equal to boiling water, and continued for at least half an hour after the case is otherwise ready for the mouth. With these precautions, the secretions of the mouth produce no change, except a very slight but agreeable change in the color, leaving a beautiful golden hue, and with a clear and high polish. The pyroxyline acquires additional solidity and strength for six months.

The plates being supplied, well seasoned, they have only to be raised with dies, as are metallic plates, but always with a screw power, never by blows. The male die should be zinc, its counterpart lead.

The impression being taken and the teeth selected, the first thing is to back them up, by putting a quantity of fill-



ings on and about the pins; then dissolve thoroughly in ether; let them dry for half an hour or more; see that the heads of the pins are uncovered, that the material may spread around the necks of the pins. Use only teeth with good roots and heads.

*Second.* The teeth being thus packed up, may be ground and articulated. When articulated and set to wax, as on metallic plates, then remove all wax from the outside of the plate with alcohol; scratch, serrate, or furrow the surface wherever the filings are to attach. Then put on a thin coat of filings *outside* the teeth; dissolve them well with ether. After a few minutes add more filings, and dissolve them. After filling up to your satisfaction upon the outside of the teeth, put up the case in plaster just as for soldering. Be more careful to carry the plaster over the cutting surface of the teeth, to hold them very fast in all directions; and let the plaster cover the inside of the plate quite up to the teeth, your filings are to cover it, to prevent the springing of the plate. Always put up your teeth on a true cast of a mouth, and keep them cramped or well fastened to the case is put in the mouth.

*Third.* You will now remove the wax, clean and scratch or furrow the plate; then put on a thin coat of filings over the teeth and over the plate as far as you wish them to extend when finished. Wet plentifully and constantly with ether until they are thoroughly dissolved and well united to the plate. Be careful in putting on the first filings, to press them before wetting, and also after partially drying, to press them thoroughly down to or under the blocks or teeth, and after each succeeding application repeat with force this process. Be sure to make all solid under and around the teeth. After the first coat being dry, add another, and yet another, until you have filled up to your pleasure, allowing each coat to dry by itself, and subjecting each to hard pressure. Be careful to keep a space between the plate and teeth until the finishing coat, and also, do not unite the teeth or teeth until the finishing coat is put on, so that the

terial may shrink toward the centre and around the pins of each block, and also shrink to the plate without drawing in the teeth. Continue hard pressure as long as you can produce any effect ; be sure and make all solid.

All done as above, remove the plaster. This may be done by cutting down to the teeth in the centre of the arch. Each side will thus pry off, leaving the teeth on the original cast. Now fill up the outside, and add another coat of clean, fine, properly colored filings ; attend to all imperfections ; burnish with a heavy hand all the filings ; brush and finish up with the pumice and whitening. Then cramp or screw your case fast to the original cast, to remain until called for. The plate can be fitted to the mouth just as a metallic plate. It will be seen in every step of the process of manipulations, reference is had to the shrinking tendencies of the material :

*First* Hence, the plates are got up and submitted to a ten tons pressure, and left to season for weeks before they are put into the market.

*Second.* When raised or put up by the dentist, they should be pressed, and for a time remain under the pressure of heated dies.

*Third.* When finished and ready for the mouth, they should be submitted to a heat, equal to boiling water, for at least a half hour, to dissipate all remains of ether and shrinkage.

*Fourth.* The filings are first put upon the teeth and pins in order to dry and shrink to the pins and not from them.

*Fifth.* The filings we first put upon the *outside*, that they may shrink up to and around the teeth, and that the inside may reach to and shrink together.

*Sixth.* The filings are to be hard pushed and parted inside, so as to unite them with the outside, and make all solid.

*Seventh.* The filings are to be kept cut off from the base inside, and also the blocks kept separate, until well dried, so as to prevent drawing the teeth out of place..

*Eighth.* A piece should never be put in the mouth, until



after being thoroughly dried and free of all taste and smell of ether. Thus there will be no change in the mouth.

For under sets, it is necessary to have the plate in a large sheet, to be cut to the case. And to prevent the danger of springing or drawing together, a very narrow plate of silver should be raised and put over the pyroxyline plate, under the teeth, not so wide but the filings will entirely cover it and hold it fast. This gives the most perfect under set ever made, all our previous views of weight notwithstanding.

A strict adherence to the above instructions will prevent all difficulties of manipulation.—*Canada Journal of Dental Science.*

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## ARTICLE V.

### *Dr. Richardson on Chloral Hydrate.*

Before commencing his lecture on Experimental and Practical Medicine on Tuesday last, Dr. Richardson offered some observations on the subject of Hydrate of Chloral to which we would call the attention of our readers. He said:

My lecture to-day is on Suspended Animation, but I will ask you to allow me first to offer a note or two on another subject, at this moment of urgent importance. I refer to the administration of the hydrate of chloral. There have recently been two assured deaths from hydrate. In the course of the past ten days, I have myself been consulted not fewer than three times on what have been considered dangers attending the administration of the hydrate, and I know generally that doubt and uneasiness prevail in the profession respecting the abuse as opposed to the use of this agent. I think it right, therefore, as I had much to do in introducing hydrate of chloral into medical practice in England, to answer a few of the questions that are most pressing from this place, where so many demonstrations of the action of the hydrate have been carried out.

1. *Is the practice of resorting to the use of hydrate of chloral, as a narcotic, in the absence of medical advice and*

*direction becoming a common practice among the people?* The answer to this question is strictly affirmative. The novelty of its administration and of proving its effects at an end, the hydrate is not at the present time used so largely by the medical profession as it was a few months ago, when its true place in the *Materia Medica* was less clearly defined. The sale of the hydrate of chloral to medical men is consequently considered as declining, while the general sale is, perhaps, increasing. Corresponding with this state of things we, in the profession, are becoming conversant with cases of what may not improperly be called "chloral drinking," and in which serious and singular symptoms are presented. Three classes of people specially resort to hydrate of chloral—viz., alcoholic devotees, who take the substance to counteract excess of alcohol and to relieve alcoholic delirium; sufferers from neuralgia and other painful chronic diseases, who find in the substance temporary relief from pain; and persons having much mental worry, grief, or care, who, flying to it at first in order to obtain sleep, continue it until the occasional practice becomes a persistent habit. As an indication of the quantity of hydrate of chloral used in this country since its introduction here about a year and a half ago, I may state, incidentally, on what I have every reason to consider reliable authority, that one commercial house alone has supplied the English drug market with ten tons of the substance; three other houses have, it is supposed, supplied as much; so that fifty tons weight have been, on this calculation, sent out—an amount which, divided into grains, would yield over thirty-six millions of narcotic doses to England alone since August, 1869.

2. *What is a dangerous and what is a fatal single dose of hydrate of chloral?* The largest dose I have known to be taken is one hundred and twenty grains. This dose produced a prolonged and dangerous coma, but recovery ultimately followed. I think we may consider a hundred and twenty grains, as a maximum dose for an adult, dangerous, but not of necessity fatal. Beyond a hundred and twenty

grains the danger increases, and a hundred and eighty may be considered a dose that would prove, in the majority of cases, positively fatal.

3. *What quantity of hydrate of chloral can be given with safety in divided doses during a stated period of time of twenty-four hours?* Judging from the physiological effects of hydrate of chloral in relation to dose, and to the phenomena in relation to time, I should infer that the body cannot decompose and throw off the hydrate more readily than at the rate of from five to seven grains per hour. There will be difference according to age of person, the temperature to which the body is exposed after the dose has been taken, and the largeness of the dose, a small dose being disposed of quicker in proportion than a large one. The variation is not such as to alter materially the action from the estimate given. I should consider, consequently, that a hundred and twenty grains, administered even in divided doses, in twenty-four hours, would be a safe limit of administration. In the treatment of tetanus this proportion has been exceeded, but not, I think, to the safety of the patient; for the fact that the hydrate of chloral overcomes or reduces the spasm is no safeguard against its own poisonous effects. From what I know, I conclude that the hydrate of chloral can be given to the extent of overcoming the severest spasm; but if the dose be carried too far with the determination of removing spasm at all risks, success may easily be bought at the expense of a fatal narcotism from the remedy.

4. *Does the frequent administration of hydrate of chloral lessen or increase the danger of the administration?* In this question I am forced to state the frequent administration of the hydrate of chloral, though it may suggest greater confidence in it on the part of those who take it, increases the danger from an excessive dose. Hydrate of chloral differs from opium in this respect. Opium produces peculiar symptoms peculiar to itself, but the dose may be steadily increased without any immediate danger from the in-

Hydrate of chloral cannot be used in this accumulative way without danger. In a word, although a person may become habituated to hydrate of chloral, there is a limitation of the quantity to be taken safely, which limitation is not materially modified by persistence in the habit of taking it, but rather the reverse.

After discussing three other questions, relating to the symptoms and pathological changes incident to the habitual use of chloral hydrate, to the chemical tests for the hydrate in cases where it has caused death, and to the post-mortem distinctions in instances of chronic poisoning by the hydrate and by chloroform, Dr. Richardson concluded by observing that as the world was indebted to the profession of medicine for the benefits derivable from the hydrate of chloral, it behoved the members of the profession to use their influence in protecting the public from an agent which, under improper use, might be turned from its good purpose to positive evil.—*London Lancet.*

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## ARTICLE VI.

### *To Reduce Gold and Silver Scraps and Filings to Plate.*

By T. L. BUCKINGHAM, D. D. S.

Now, when rubber work has nearly run its course, as I hope it has, and patients are beginning to demand better materials, it may not be out of the way to say a few words in regard to reducing gold and silver scraps and filings to plate, so that they can be worked up. This information is required more by the younger members of our profession than by those older, as many of them have come into the profession since rubber-work was introduced, and have seen little or no metal work done; in fact, we have occasionally students who have been in practice four or five years, and have never done a piece of metal work. I think the profession at large will agree with me in saying, that continuous gum, gold, or even silver work, is much better than this cheap rubber work, that is so generally used.

It does one good to see gold work that has been nearly as well as it did some comparison between that there is between a filling.

As we cannot afford to

As we cannot afford to ~~lose~~ <sup>lose</sup> ~~the~~ <sup>the</sup> ~~gold~~ <sup>gold</sup> and silver scraps and filings as we do ~~them~~ <sup>them</sup> if ~~unimpaired~~ <sup>unimpaired</sup> I will know some process to reduce them to ~~gold~~ <sup>gold</sup>. The process I have adopted, and, if tried by others, I think will be found very good. I will not say the best, for the ~~same~~ <sup>same</sup> results may be arrived at by other processes. It is to first ~~wash~~ <sup>wash</sup> the scraps and filings as clean as possible, i.e. with the ~~process~~ <sup>process</sup> one a large amount of foreign matter will ~~get~~ <sup>get</sup> it. We have constantly to use zinc and lead for our ~~tests~~ <sup>tests</sup> in ~~summers~~ <sup>summers</sup> for patterns, and the wearing of the ~~first~~ <sup>first</sup> ~~while~~ <sup>while</sup> iron or steel. These, with the plaster and other substances that will get in, make quite a conglomerate mass. The first thing I do with my gold scraps and filings is to pick out all the large pieces of gold with a pair of pliers, removing all the large pieces of the other baser metal. Then sieve the small scraps and filings through a sieve, which I have made out of a tin blacking box lid by punching it full of holes with a plate punch as far in as I could reach, and then making holes in the centre with a small punch and hammer. It may be possible to buy small sieves, but I have not seen them for sale at any of the depots. This separates the filings and very small pieces from the scraps. The scraps are now spread out on a piece of clean paper, and all the pieces of baser metals are picked out with a pair of pliers. Through the filings is first passed a magnet, which removes all the iron and steel; they are then put into an evaporating dish or Florence flask, and some dilute nitric acid poured on them. This dissolves the silver and baser metals, except the tin, which is oxidized, and remains with the gold fillings. When the acid ceases acting it is poured off and kept, to obtain the silver which it contains. The filings should

be washed several times with fresh water and then dried, when they are ready for melting. The larger pieces of scraps and parts of old plates that contain no solder, and are firm enough to make plates out of again, should be melted together, and when in a melted state a few pieces of saltpetre (nitrate of potassa) should be thrown into the crucible. Nitrate of potassa is decomposed, the oxygen oxidizes the baser metals that are present, and they are absorbed by the crucible, but it is exceedingly difficult to get rid of all the tin in this way; it is one of the hardest metals to separate from gold that we have, and there will be nearly always a small portion remaining, but as it adds to the elasticity and hardness of the gold the small quantity that is left does little harm. We cannot be certain of the quality of gold refined in this way—it may be more or less than eighteen karat fine; the platina and tin changes the color very much, and also gives it hardness and elasticity, so that this gold should be used for making clasps and stays for the teeth; for which purpose it answers better than the gold plates alloyed from the coin.

To reduce silver scraps and filings, we proceed in the same manner that we do with gold, separating the larger pieces that will do to melt without being refined and melting them with a little borax, or if they contain solder, and it is necessary to refine them, throwing into the crucible a little saltpetre until they are melted. By using a sufficient quantity of saltpetre they may be made nearly pure silver. The scraps which contain solder and the filings, after being sieved and having a magnet passed through them to remove the iron, should be put into an evaporating dish or Florence flask, and have dilute nitric acid poured on them; this, with a gentle heat, will dissolve the silver. The acid should be added until it ceases acting, which may be known by no more red fumes coming over when fresh acid is added. This operation should be performed in a chimney place, or where there is a draft of air to carry the fumes out of the laboratory, as they are poisonous to inhale, and oxidize the instruments

when they come in contact with them. The residue that is left in the flask, after the acid containing the silver is poured off, usually has enough of gold filings with it to pay for the trouble of refining the silver. It is singular with what tenacity gold will stick to nearly everything it comes in contact with, except a man's pocket book, and there it almost appears to undergo a spontaneous evaporation.

The next part of the process is to obtain the silver from the solution. This may be done in several ways. If a piece of copper plate be suspended in the fluid that contains the silver, the nitric acid will leave the silver and combine with the copper. The silver will fall down in a dark, grayish, crystalline mass, and only requires to be dried and melted with a little borax, or the solution may be diluted with twice its bulk of water or more, and a solution of common salt (chloride of sodium) poured into it, taking care not to pour too much in at one time. A white curdy precipitate forms, which soon falls to the bottom of the vessel. When no more of this precipitate is formed when fresh additions of the solution salt is added, it may be allowed to settle, and the fluid poured off and thrown away, as it contains nothing worth saving. The chloride of silver should now be washed by pouring over it some fresh water, and stirring it up; when it has settled, pour the water off; by repeating this operation several times, the chloride may be washed perfectly clean.

The next part of the operation is to reduce the chloride of silver. The chloride should be covered with fresh water, and add a small portion of sulphuric acid; then put a few small pieces of zinc in the vessel, and let it stand for a day. The chlorine will leave the silver and combine with the zinc. When all the chloride has been reduced, it is better to use an excess of zinc and sulphuric acid, to ascertain that the chloride is all reduced. The zinc, if any remains, should be removed, and fresh sulphuric acid added, so as to dissolve any zinc that might remain. As much of the fluid is now to be poured off as can be, without losing the silver, fresh

water poured on, and this is to be repeated until the water comes off tasteless. The silver will be in a dark grayish powder, much finer than when it is precipitated with copper, and only requires to be melted and rolled to be brought into plates. There are other processes of reducing the chloride of silver, but the above are the simplest and least expensive.

Pure silver is always useful in the laboratory. We use it for making solder; two parts silver and one of fine brass makes the best silver solder. The silver should be melted first, with a little borax, and, while melted, the brass dropped in. If they are both melted together a portion of the brass will be burnt out, and the solder will not be so good.

Gold alloyed to the required karat with silver solder makes the best gold solder. Pure silver is too soft to make plates, but it can be used for rimming above the teeth, as it can be bent more easily than coin. Silver alloyed with platina makes a stiff plate, and is preferable to coin as it contains no copper.

Silver wire dipped in nitric acid forms nitrate of silver on the surface of the wire, and the caustic may be applied in this way to the gums, or to the pulp of a tooth, or into an alveolar abscess, more easily than it can from a solid stick of caustic.—*The Dental Times*.

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## ARTICLE VII.

### *Salivary Fistule.*

Here is a young woman who has been troubled with open ulcer upon her cheek for nearly two years. Her difficulty commenced as an alveolar abscess, from the second molar tooth, a disease the varied results of which I so often bring before you; (and do you not remember last summer, how I then urged upon you the necessity of a thorough comprehension of the subject, since you would so often meet with its victims?) This abscess opened not into the mouth, but burrowed upward through the buccinator muscle, perforated the



Stenonian duct, and finally opened upon the cheek, forming a fistulous track which communicated not only with the root of the tooth, but also with this duct, and we consequently have both saliva and pus constantly exuding from this orifice. Here, then, are two indications to be fulfilled in the treatment. In the first place the primary cause must be removed, and this cause exists in the two remaining carious fangs of the tooth above mentioned, which will continue to exercise their irritating influence as foreign bodies so long as they remain in their present position. They must, therefore, be removed, thus giving nature the power to complete the removal of the difficulty. In the second place, having removed the cause of drainage, the saliva must be turned into its normal receptacle, the mouth.

This ulcer has resisted various treatments during these two years, for although its salivary nature was recognized, yet the underlying causes, these carious fangs, were not removed, and of course the discharge continued and must have an outlet. As these roots are below the margin of the gum, we shall use the "elevator" for their extraction. [Tooth roots here lifted out by the "elevator."]

Now we have removed the exciting cause of all this difficulty, and will next try to cure this intractable ulcer upon the cheek. What must we do? We must make a passage by which the saliva will find a more easy outlet, thus turning it out of its present channel and giving opportunity for repair. For the accomplishment of this purpose a strand of silk is threaded at each end to a straight or curved needle, and these needles are successfully passed into the fistula and carried out through the mouth, leaving about a line of tissue between the two points of passage. Removing the needle, a loose knot is then tied, forming a short loop, or else the intervening tissue may be immediately strangulated, and the loop allowed to ulcerate its way through. As this separation occurs, the saliva will take its course through this opening into the mouth (provided it has been made of

sufficient size), and the external wound will heal usually of its own accord, but may sometimes require slightly stimulating with arg. nitr. I think that you will seldom be required to pare the edges of the external wound. This operation I prefer to that of Horner, where the whole tissue is cut out with a sharp saddler's punch, as you will find described in your surgical works, since it is perfectly simple and reliable.

Another mode of operation is by the use of a conical cotton tent, which is inserted into the wound after a puncture has been made with a bistoury entirely through into the mouth, its base being placed in that portion of the track situated nearest the inside of the cheek, with the delicate point of the pyramid at the external fistule. This, by its unequal expansion, will dilate the internal orifice and permit the narrowing of the external, when, after a few days, it may be removed and a similarly shaped cone of folded iron-wire inserted in its place, the apex of which cone should consist of but a single wire. This will induce a patulous condition of the oral passage, while the fistule will diminish in diameter to the size of the wire, when you will have but to remove it, and all will be well in two days.

Some one of these operations will usually be found applicable, but in cases where the fistule is the result of extensive sloughs, as in *cancrum oris*, autoplasty may be required.

These salivary fistules you will find to baffle all your attempts by stimulants and caustics, and I would rather advise you to operate at once. The worst cases are those where some of the lobules of the parotid glands have been injured; and let me here caution you to be extremely careful, in all your operations in the region of the gland, not to cut through that strong fascia, for should you cut but one lobule of the gland, a fistule may result.

[The two needles were then carried through, bearing the thread with them; a loop was made and allowed to hang loose in the mouth. In a few days it had cut a passage into the mouth; the saliva followed its tract, and after a

single application of arg. nitr. the girl reported in two weeks entirely well.—DE F. W.]—*Professor Garretson's Clinic. Medical and Surgical Reporter.*

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### ARTICLE VIII.

#### *Excision of a Portion of the Lower Jaw.*

Dr. Forbes exhibited the patient and said :—

The case of the young woman now before the College is one of excision of one-half of the lower jaw-bone, with the exception of the condyle and coronoid process. The ablation was from the symphysis to the sigmoid notch on the left side.

The operation was performed just a year ago, and the woman is now in the enjoyment of excellent health. The sinking of the cheek is but little and the deformity is slight as the Fellows of the College will observe only a very small linear cicatrix from my excision, extending from the inferior margin of the symphysis along the under surface of the body to the posterior aspect of the angle of the bone.

H. B., aged 23 years, unmarried ; works at a sewing machine ; came in the Episcopal Hospital on the 9th of February, 1869.

Three years previous to her entrance she had observed a lump on the lower part of the gum of the left side of the lower jaw which she attributed to some decayed teeth, but having the teeth removed the lump did not disappear—on the contrary, it soon got larger. It gave her but little pain, and grew slowly, when in September, 1868, she observed some "growths" coming up from the jaw where the teeth were formerly lodged and which had been removed nearly a year previous. Early in November 1868, she went to the clinic of the University of Pennsylvania, and a portion of the tumor was removed through an incision extending along the inferior lateral surface of the bone. The wound healed, leaving an elevated line or cicatrix. Soon after this she entered the Episcopal Hospital, and when I came on duty in

April the tumor was observed to be increasing. It had been three years in attaining its growth; it was comparatively painless; the tissues covering it remained healthy, though greatly distended; the absence of all glandular disease and of all cachexia, and any tendency to ulceration; its situation and the freedom from resentment of any injury, although a portion of it had been removed some months previous, all these points indicated its benign nature, and the propriety of recommending its removal. Accordingly at a consultation held the first week in May it was so decided. The patient was anxious for the operation, and it was at once performed.

Ether being administered the left inferior incisor was removed, and an incision was made with a bistoury under the chin just behind the symphysis and the knife carried up close behind the bone on its concave aspect until it appeared behind the gap made by the drawn tooth; a chain was then passed up through this opening by means of an eyed probe armed with a ligature having the saw attached. The jaw-bone was then bisected at the symphysis, the tongue being held out of the way by means of a thread passed through its tip. An incision was then made from the under surface of the symphysis along the inferior border of the bone to the posterior aspect of the angle; the facial artery was cut and secured at both ends, the soft parts with as much of the periosteum as possible were elevated; a similar incision was made nearly parallel to this so as to include the rough linear cicatrix of the former operation, and the parts detached as rapidly as possible. The inferior dental nerve and artery where they enter the posterior dental foramen were severed and the artery secured. The chain saw was now passed around the middle of the ramus of the bone and the end near the symphysis grasped with a strong pair of forceps, was held by an assistant, and the section of the bone removed.

The gap thus made was large—six ligatures in all were applied and the general oozing arrested by bathing the part

with equal parts of alcohol, laudanum, and water. The amount of blood lost was believed to be about four ounces. The lips of the wound were approximated and held by leaden wire, and the cavity packed through the mouth with pledgets of lint. A dressing of cerate was applied and sustained by a bandage, the ligatures being brought out of the angle of the mouth. The patient reacted well, and an anodyne being administered she was removed to the ward. The anodyne was repeated frequently, and she was sustained by liquid nourishment. The sutures were removed the third day; the ligatures came away in due time, and in four weeks she left the house well.

On examining the tumor it was found inclosed by the body of the bone, having distended its walls, particularly the outer one, until they had become exceedingly thin and destroyed in two places, as may be observed in the specimen in the bottle. Its boundary was well defined, though it was not in a capsule; its centre was soft and almost gelatinous, and of a grayish-white colour; and every part of it was easily broken up. On examination under the microscope, cells, angular and attenuated like caudate cells, having dotted contents, nuclei and nucleoli, and free nucleoli, as observed by Mr. Paget in his description of myeloid tumours, were readily seen. With Mr. Paget, I prefer to believe, however, that the true nature of morbid growths generally is to be apprehended more correctly by examining them as living things, and modes of life rather than conditions of structure determine me in classifying them.

The tumour was evidently a myeloid one, the nature of which has been well described by Mr. Paget, and more recently by Mr. Christopher Heath in his excellent work on Injuries and Diseases of the Jaw, the Jacksonian Prize Essay of the Royal College of Surgeons of England published in 1868.—*Transactions of College of Physicians.*

## MONTHLY SUMMARY.

*Styptic Wool.*—Dr. Ehrle, of Isny, in the interest of his countrymen wounded in the present war, desires to make known a very simple preparation of wool that he has found very serviceable in arresting hæmorrhage after operations or from wounds. To prepare it he boils the finest carded wool for half an hour or an hour in a solution containing four per cent. of soda, then thoroughly washes it out in cool spring water, wrings and dries it. The wool is thus effectually purified, and is now capable of imbibing fluids uniformly. It is then to be dipped two or three times in fluid chloride of iron diluted with one-third of water, expressed and dried in a draught of air, but not in the sun or with high heat; finally it is carded out. Thus prepared, it is of a beautiful yellow color, and feels like ordinary dry cotton wool. As it is highly hygroscopic, it must be kept dry, and when required to be transported must be packed in caoutchouc or bladder. Charpie may be prepared in a similar manner, but on account of its coarse texture, is not so effective as cotton wool, presenting a less surface for coagulation. When the wool is placed on a bleeding wound, it induces moderate contraction of the tissue, coagulation of the blood that has escaped, and subsequently coagulation of the blood that is contained within the the injured vessels, and thus arrests the hæmorrhage. The coagulating power of the chloride of iron is clearly exalted by the extension of its surface that is in this way effected. The application of the prepared wool is not particularly painful, whilst, by sucking up the superfluous discharge and preventing its decomposition, it seems to operate favorably on the progress of the wound. The unpleasant secondary results that have led many practical surgeons to discard the use of the pechloride of iron do not occur with the wool when it is properly made and applied. In cases of wounds where the bleeding proceeds from large and deep seated vessels, it may be used as a compress, a bandage being applied over it, or the wound may be plugged with it. It may also be employed with advantage in cases of profuse suppuration, to imbibe the discharge and purify the surface. He recommends that a small portion should be given to every soldier on going into action.—*Lancet*.

*Dangers of Snuff-Taking.*—In one of our hospital reports will be found a startling instance of the poisonous effects of lead being produced by the use of contaminated snuff. The victim who was a resident in India, was in the habit of taking "best brown rappee," exported by a well known and popular English firm in leaden cases. His medical advisers first attributed the failing power of his upper extremities, and other unpleasant symptoms, to the use of his favorite tobacco; but, after he had been to the trouble and expense of coming to England in search of further advice, his suffering was traced to the real source. To be quite certain, six separate packages were ordered from Calcutta, and a sample from each of them was found to contain an intimate union with a considerable quantity of lead. Rappee appears to be a rather moist preparation of the refreshing weed, and, where it adhered to the sides of the leaden cases, it was in these instances found to be dotted with spots of carbonate of lead, formed, it is supposed, by a combination with the walls of the case, of carbonic acid, liberated by the fermentation of the damp snuff: it presented, in fact, a miniature example of the process by which white lead is manufactured for commercial purposes. A medical man, who has recently returned from Calcutta, states that he had lately met with three patients suffering in the same way from the same cause. They are probably not the only snuff-takers who are being poisoned with lead. Both manufacturers and consumers would do well to see to it at once that damp provisions are no longer stored in leaden cases.—*Lancet*.

\* \* The above remarks suggest an inquiry whether the common practice of putting up chewing tobacco in lead foil may not account for some of the numerous cases of lead poisoning not traced to any recognized source. Ed. M. G.—*Med. Gazette*.

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*Simple Method of Arresting Obstinate Epistaxis.*—A writer in the *Gazette des Hopitaux* states that attentive observations of the face of a patient attacked with epistaxis will detect a slight intermittent movement of the soft parts near the ala of the nose on the side where the blood is flowing; even if this pulsation be not seen, it may be felt. Pressure with the finger over this branch of the facial artery is said to arrest the hemorrhage immediately.—*Med. Gazette*.

*Borax.*—It may not be generally known how very valuable borax is in various purposes of household use. We find it the very best cockroach exterminator yet discovered. One half-pound, costing but fifty cents, has completely cleared a large house formerly swarming with them, so that the appearance of one in a month is quite a novelty. The various exterminating powders puffed and advertised have been found not fully effective, tending rather to make the roaches crazy than to kill them. There is something peculiar, either in the smell or touch of borax, which is certain death to them. They will flee in terror from it, and never appear again where it has once been placed. It is also a great advantage that borax is perfectly harmless to human beings; hence no danger from poisoning. It is also valuable for laundry purposes. The washerwoman of Holland and Belgium, so proverbially clean, and get their linens so beautifully white, use refined borax as washing powder instead of soda, in the proportion of a large handful of borax powder to ten gallons of water. They save soap nearly one-half. All the large washing establishments adopt the same mode. For laces, cambrics, etc., an extra quantity of the powder is used; and for crinolines (requiring to be made stiff) a stronger solution is necessary. Borax, being a neutral salt, does not in the slightest degree injure the texture of linen. Its effect is to soften the hardest water, and therefore it should be kept on the toilet table. As a way of cleaning the hair, nothing is better than a solution of borax in water.—*Manufacturer and Builder.*

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*Treatment of Wounds by Pneumatic Occlusion.*—One of the last numbers of the *Gazette Medicale de Paris* contains a suggestion by M. Guerin for treating wounds by the exclusion of the atmosphere. This is accomplished by placing over the wound a small sac or cylinder of caoutchouc, to the extremity of which a pipe is inserted that is attached to a balloon or chest destitute of air, and which consequently exerts a constant suction power over the seat of injury. By this means, according to M. Guerin, the approximation of the edges of the wound, and their consequent healing by first intention, is facilitated, while it prevents the absorption of pus. By this means, in fact, the wound is placed in the condition of a subcutaneous injury.—*Lancet.*



*Death from Chloral Hydrate.*—Dr. George Needham reports in the *Journal of Psychological Medicine* a case of fatal cerebral congestion following the administration of Hydrate of Chloral to a married woman, aged 50, of hysterical diathesis, who had suffered for some two years with symptoms of mental derangement, consisting of distressing "nervousness," fear of impending death, hesitation, suspiciousness, etc. Ophthalmoscopic examination showed an enlarged and tortuous condition of the retinal vessels. In October, 1870, the loss of a relative threw her into a state of much excitement, for which she took, on October 19th, 115 grains of bromide of potassium. On the 21st, chloral hydrate was prescribed in thirty-grain doses, of which she took six, as follows:—On the 21st, at 5 30 p.m. and 11 p.m.; on the 22d, at 10 a.m. and 3 p.m.; on the 23d, at 1 a.m., 8.10 a.m., and 1.30 p.m. On the afternoon of the 22d she was sleeping quietly, with a somewhat rapid pulse, and was found in the same condition at two visits (morning and evening) on the 23d. On the morning of the 24th, her continued sleep created alarm, and ineffectual attempts were made to rouse her, which were maintained during the day and night. Sulphate of strychnia was thrice injected in doses of one thirtieth of a grain at intervals of four hours during the night. Coma progressed to a fatal termination on the afternoon of the 25th. The autopsy revealed extreme hyperæmia of the pia mater and brain substance. A year before, the patient had taken nearly the same quantity of chloral within the same period of time without ill effects. The writer suggests that the previous administration of a long course of bromide of potassium may increase the danger of full doses of chloral.—*Med. Gazette.*

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*Adulterations of Vinegar.*—It is a well known fact that few articles of commerce are more adulterated than vinegar. Cayenne pepper and some bitter root are used, but oftener less harmless and even poisonous substances are mixed with the vinegar.

A very simple means of detecting these adulterations is the following:—Neutralize the vinegar with carbonate of soda, concentrate the obtained solution by boiling it down to about one-half its quantity and let it cool. If it leaves a hot and burning taste on the tongue, it is adulterated.—*Med. Gazette.*

*Health*—In a recent address, Lord Stanley said to some men starting in life :—

“Let them recollect that the race in which they are engaged is one which will last all their working days, and in which endurance is more important than speed. They know already that intemperance is one form of suicide—let them remember that all neglect of physical laws is open to the same reproach, and that there may be intemperance in work as well as in manner indulgences. You cannot have mental efficiency without health ; you cannot maintain health in an exciting and exhausting employment, such as most mental occupations are, when eagerly followed, without some care to preserve it. What I had to tell you about keeping up literary tastes has been said already. They are a great pleasure—a wholesome and a lasting one. Keep them up if you can, and as long as you can. But while you do that, remember also that there is one thing as compared with which not only material health and luxury, but all art, all literature, all science even, are relatively unimportant, and in regard to which the poorest laborer may compete with any of you on equal terms—I mean a steady, untiring performance by each individual of his public and private duty.”

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*To Detect Manufactured Rum or Brandy.*—Mix the liquid to be tested with about one-third its quantity of concentrated English sulphuric acid of 1.840 sp. gr. If pure, there remains, after cooling, the specific aroma or flavor of the liquid, which is not lost even after 24 hours ; whereas, if adulterated, the flavor is lost. The sulphuric acid itself or the heat it evolves seems to destroy the essential oils used for flavoring.—*Med. Gazette.*

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*Death from the Inhalation of Ether.*—In the number of the *Boston Medical and Surgical Journal* for Dec. 8, 1870, there is reported by Walter Burnham, of Lowell, a case of “death from the effects of sulphuric ether,” in the opinion of the editor “the result of an overdose.” The operation was an amputation of the thigh for a gunshot wound ; an ounce of ether was administered on a small napkin in a bowl, which was placed over the face, and one or two drachms were added every two or three minutes. In about ten minutes anæsthesia was induced, and the ether sus-

pendent; slight sensibility returning the ether was renewed with the desired effect, and again suspended. The operating surgeon then ordered the napkin to be reapplied with a drachm of ether freshly poured upon it. After one or two inspirations the patient ceased to breathe.—*Med. News.*

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*The Career of Dentists.*—A dentist in Philadelphia has traced out the career of 1,000 dentists, with this result:—163 died before they reached middle life; 643 attained fair success, 57 made fortunes, 27 died from intemperance and other vices, 96 failed entirely, and 3 committed suicide.—*Boston Medical and Surgical Journal.*

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*Modern Surgery.*—An illustration of the advance in surgery made in the present century may be found in the fact that the operator who first successfully tied the internal iliac artery for aneurism, Dr. Stevens, died only two years ago. Dr. S., who then lived in the West Indies, was only twenty-six years of age, in 1812, when he achieved this feat. Nine other operations of this kind, performed since, are upon record, with four successes, so that the proportion of deaths is only 50 per cent.—*Richmond and Louisville Medical Journal.*

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*Asthma.*—In an interesting discussion on the management of asthma, by the members of the *Baltimore Pathological Society*, Dr. Garretson, (*Baltimore Medical Journal*) alluded to the case of Colonel Washington, subject to attacks of this affection lasting four or five days, who was relieved in two days by bromide of potassium and belladonna.

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*Skin-Grafting Superseded.*—Recent statements on the interesting subject of skin-grafting seem to show that they were mistaken who at first thought it necessary to transplant pieces of skin of any depth. All observers now agree that the first phenomenon is the disappearance of the characters of true skin in the piece transplanted, which becomes a mere pelicle. Further, there should be no trace of areolar or adipose tissue left, and Dr. Fiddes says that there is no necessity to take any skin, but merely a few epidermic scales.—*Med. Press and Circular.*

*The Seat of Tumor.*—Virchow (*N. Y. Med. Journal*) states that those organs which possess a soft surface, and are often brought in contact with foreign bodies, are oftener the seat of tumors than those which are shut up in cavities, and are rarely brought in contact with outside influences.

*Carbolic Acid in Carbuncle.*—Dr. J. C. Nott, of New York [*N. Y. Med. Journal*], advocates the local use of carbolic acid in carbuncle, and publishes an obstinate case which was cured after seven applications. He believes this acid to be more penetrating in its action, more efficient as an antiseptic, than sub-sulphate of iron.—*Med Record*.

## EDITORIAL DEPARTMENT.

*The Thirty-first Annual Commencement of the Baltimore College of Dental Surgery*, was held Thursday evening, March 2d, 1871, in the Concordia Opera House. The spacious Hall was crowded with as brilliant an audience as ever assembled on a similar occasion, many being obliged to stand; and altogether the scene was of that attractive nature which scarcely any occasion except a college commencement could have produced. Holland's Blues Band entertained the large assembly with a number of appropriate musical selections. Upon the stage were seated the members of the Faculty, the graduating class, and a large number of guests, among them the Deans and several Professors of the two medical colleges of this city; while the front of the stage was strewn with boquets, intended as offerings of esteem and friendship from the many lady friends of the graduates.

The exercises were opened with prayer by the Rev. E. R. Eschbach, D. D., after which Prof. F. J. S. Gorgas, M. D., Dean of the Faculty, read the authority for conferring the degree of Doctor of Dental Surgery, from the Charter of the Institution, granted in 1839, by the Legislature of the State of Maryland, and announced the names of the graduates.

Professor Gorgas then conferred the degree of "Doctor of Dental Surgery" upon the following gentlemen:

|                              |                       |
|------------------------------|-----------------------|
| Edward William Anderson..... | Virginia.             |
| Mintern S. Brown.....        | District of Columbia. |
| Oliver A Dailey, M. D.....   | District of Columbia. |
| John Hiram Darrell.....      | District of Columbia. |
| Charles William Fisher.....  | Texas.                |
| William J. Fogle.....        | Georgia.              |
| Frank Lewis Harris.....      | Virginia.             |
| James Richard Harvey.....    | Arkansas.             |

|                                |                              |
|--------------------------------|------------------------------|
| Thomas Milton Howard.....      | <i>Georgia.</i>              |
| Exum Lewis Hunter.....         | <i>North Carolina.</i>       |
| Robert Green Hunter.....       | <i>Florida.</i>              |
| Henry Cabell Jones.....        | <i>Virginia.</i>             |
| Robert Edward King.....        | <i>North Carolina.</i>       |
| Thomas Berwick Legare.....     | <i>South Carolina.</i>       |
| Francis Hilleary Mannakee..... | <i>Maryland.</i>             |
| William A. Mills.....          | <i>Virginia.</i>             |
| John Marshall Norman.....      | <i>Tennessee.</i>            |
| Ambrose Schuyler Page.....     | <i>Virginia.</i>             |
| Thomas Henson Parramore.....   | <i>Virginia.</i>             |
| John Francis Poulton.....      | <i>Virginia.</i>             |
| Joseph Henry Scales.....       | <i>Virginia.</i>             |
| Samuel Isaac Scott.....        | <i>Maryland.</i>             |
| James Hosea Sherwood.....      | <i>Maryland.</i>             |
| Edward Hopkinson Stelle.....   | <i>District of Columbia.</i> |
| William Luoio Stewart.....     | <i>Texas.</i>                |
| Lawson Browning Wilson.....    | <i>Maryland.</i>             |
| George S. Yingling, M. D.....  | <i>Ohio.</i>                 |

After the regular degrees were conferred, Professor P. H. Austen announced that although the *Gradus Honorarius* of Doctor of Dental Surgery had not been conferred since 1860, the Faculty would deviate from the rule by conferring this degree upon Norman William Kingsley, of New York, for "Scientific Investigation of Deficiencies of the Palate, and the application of a very remarkable artistic skill to the Artificial Replacement of the same."

This degree, which, after an interval of ten years, the College has resumed the right occasionally to confer, must necessarily be unsolicited, and will always be given in recognition of special service, and not of general excellence or high standing.

The College will under no circumstances take cognizance of, or feel called upon to reply to *an application* for its Honorary Diploma.

The following is a copy of the Diploma conferred on Dr. Kingsley:

THE BALTIMORE COLLEGE OF DENTAL SURGERY.

To all whom it may concern.

*Whereas:* It is a chartered right and privilege of this Institution to confer the seal of approbation upon any important service rendered to the Science and Art of Dentistry; or upon any addition to its means of relieving human suffering, and

*Whereas:* NORMAN WILLIAM KINGSLEY, of the City and State of New York, and United States of America, by a Scientific investigation of *Congenital Deficiencies of the Palate*, and by the application of a very remarkable artistic skill to the *Artificial*

*Replacement* of the same, has demonstrated the high capabilities of Dental Art and has rendered invaluable service to this unfortunate class of sufferers:

Now therefore, We, the *Faculty of the Baltimore College of Dental Surgery*, in acknowledgement of these services rendered to Dentistry and to Humanity, do hereby confer upon the said NORMAN WILLIAM KINGSLEY, the *Gradus Honorarius* of our Institution with all the privileges and immunities thereunto belonging.

In testimony whereof, we have caused to be executed this DIPLOMA of MERIT and have thereunto severally set our hands and the Corporate Seal of our College, on this second day of March, in the year of our Lord, one thousand eight hundred and seventy one.

|                                                                                        |   |                                                             |
|----------------------------------------------------------------------------------------|---|-------------------------------------------------------------|
| Given at the City of<br>Baltimore, State of Maryland, }<br>United States of America, } | { | Signed by the Faculty,<br>with<br>Seal of College attached. |
|----------------------------------------------------------------------------------------|---|-------------------------------------------------------------|

The Valedictory Address was then delivered by Professor Thomas E. Bond, M. D., who humorously referred to the manner in which each professor was expected to take his turn in the delivery of the valedictory, took up the subject of man, and spoke of him as a "moral and intellectual animal. The error of life, he said, was that we were apt to look at and deal with ourselves in sections. We were apt to talk of the soul, body and spirit as being separate and divided. Not so, he said, they were a unit. The great difficulty was in not seeing it in this light.

People were too apt to look upon Sunday as the soul's day—hence some persons only practice religion on that day. As the graduates were going out into the world to assume the responsibilities of men, it was important, he said, to start right. This was a fast age, God knows it is, and so does the devil. The trouble was that the whole community was drifting too much into animalism, were living too much apart from the intellectual and moral portion of their being. This, he said, was found as much among the ladies as among men. Women were given too much to decorating themselves with porcupine quills and red tape.

In starting out into the world they should remember that they had each a soul, and the great attribute of the soul was love. They should remember all the time that they had a soul during the week as well as on Sunday, and even a dentist should do this, for though a dentist may have no feeling, he has a soul. They should remember that they had something that the monkey has not. As the soul had but one attribute, love, they should soon turn their love towards God.

The doctor concluded by exhorting the graduates to begin right in this world, so as to end in imperishable glory in a brighter world. He was attentively listened to by the large audience throughout.

Following the remarks of Professor Bond, an appropriate address was delivered in an able manner, by Henry Cabell Jones, of the graduating class, which we publish in the present number of the *Journal*. The exercises, which were highly interesting throughout, were closed with the benediction by the Rev. Dr. Eschbach.

The next session of the College will commence on the 16th of October, 1871.

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*The New Orleans Dental College.*—The commencement exercises of the New Orleans Dental College, were held on the evening of the 7th of March, at the rooms of the College on Carondelet street. The lecture room of the institution was filled by a company of intelligent ladies and gentleman, who witnessed the exercises with great interest. Among those assembled were a number of members of the dental profession in New Orleans.

The exercises were opened with prayer by Rev. C. S. Hilton, of Christ Church. Dr. J. S. Harrison, one of the Faculty of the College, then read an interesting lecture, the subject being "Incentives to the study of the Natural Sciences." The lecture evidenced great research, and the various subjects it embraced were ably treated. It is to be regretted that the Professor omitted some portions of the lecture from the unfounded fear of taking up too much time. Dr. Harrison at the close of the lecture, made a few judicious remarks appropriate to the occasion, and addressed more particularly to the students of the college.

The Dean of the Faculty, Dr. J. S. Knapp, then made a short address to the graduating class, and conferred the degree of Doctor of Dental Surgery on five young gentleman: John A. Arrington, of Tennessee; Thomas D. French, of Mississippi; Herbert Norman, of South Australia; Sidney M. Cook, of Louisiana; and Charles P. Angell, of Louisiana. Honorary degrees were conferred on Messrs. S. J. Cobb, of Tennessee; Rufe Waldo Thornton, of Georgia; and Joseph C. Turner, of Alabama.

An address on behalf of the students was then delivered by Mr. Herbert Norman, of South Australia, one of the graduating class. The address was listened to with attention, and received with plaudits.

Not the least interesting feature of the occasion was the bestowal of splendid bouquets upon the graduates by young ladies in the assembly. A few remarks from Dr. Harrison terminated the exercises.

THE  
AMERICAN JOURNAL  
OF  
DENTAL SCIENCE.

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Vol. IV.

THIRD SERIES—APRIL, 1871.

No. 12.

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ARTICLE I.

*Inflammation of the Dental Pulp.*

[From the German of Prof. Dr. C. Wedl.]\*

By JAS. H. LUDWIG, M.D., D.D.S.

When we bear in mind the many accidents to which the teeth are liable, we are really surprised that primary or idiopathic inflammation of the dental pulp does not occur more frequently than is actually the case. J. Tomes thinks, that even in as many as 99 cases in the 100, disease of the pulp as a result of caries is dependent on perforation of the pulp-cavity. Heider, also (*Zeitschrift der k. k. Gesellsch. der Wiener Aerzte* 1846 : abhandl. über Zahnschmerz) has written in a similar manner.

The existence of an idiopathic inflammation is determined with difficulty, and this difficulty is increased when the diagnosis has to be made by exclusion often difficult to do on account of established caries, and also when a developing periostitis may be taken for a pulp inflammation. A third difficulty is found in the difference between a commencing inflammation, and that state of congestion produced by hyperæsthesia of the pulp. In the absence of objective

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\* Pathologie der Zähne, mit besonderer Rücksicht auf Anatomie und Physiologie.



appearances, we are obliged to depend upon the subjective altogether, while its termination can only be known by its course. If decided intermissions of the pain occur, and if hyperæsthesia be present in other organs, we will have good cause for excluding inflammation.

If we observe carefully inflammation which is the result of so-called perforating caries, and take into consideration the preceding pain, we find that it is at first local, but afterwards invades the neighboring teeth, and even radiates over the entire side of the face.

The partially exposed pulp is acted upon by outside influences ; cold air, cold water, and acid substances act upon it with pain, while pressure upon the affected tooth produces a sense of relief, provided the exposed part of the pulp has not been pressed upon. The intensity of the pain varies according to the constitution and age of the individual, and frequently increases during pregnancy and the menstrual periods. In most cases the inflammation becomes supplicative, which we can see at the upper surface of a part of the pulp, and often at last we have an oedematous appearance, or it is covered with a lymph, sticky flow. If there is no hindrance opposed to the discharge of the formed pus, a marked remission of the spanning, drawing or throbbing pain occurs, and even a decided intermission may take place, so that the patient will only be reminded of his sick pulp by some particular circumstance. The acute form then passes into the chronic.

If the pulp cavity has not yet been opened by the carious process, and only a thin portion of dentine remains as a protective covering to the pulp, it is readily influenced by outward agents of medium severity, and we have by this condition of things what dentists term, *odontalgia nervosa ex carie*. Inflammation, says Heider, does not seem to be present, for the paroxysms of pain occur frequently with great severity without any foreboding, but are often separated by entirely painless intervals. Cold impressions which in other cases of inflammation diminish the pain, increase it in these. Grad.

ually warm and cold impressions cause a slight, temporary pain, on which account the patient is careful to avoid hot and cold food and drink, while that side of the jaw upon which the carious tooth is located becomes useless for mastication, on account of the intense pain produced in the act of biting, by food being forced into the decayed cavity. After this state of things has existed for a longer or shorter time, there generally follows after the pulp-cavity has been broken into, instantly such a severe pain, that tears flow from the eyes, and the patient feels as if it were impossible to endure the pain, did it last for any length of time. In a few minutes the pain lessens and becomes more bearable, but is still very threatening, and may continue for hours with exacerbations and remissions. It finally ceases gradually, and we generally have a short, painless interval, but the pain soon recurs, although no outside influences may be acting upon the nerves of the exposed pulps. The patient, however, does not always remain free from intense pain until exposure of the pulp occurs; frequently, after a few temporary pains of moderate severity have once occurred, there may be produced from very slight causes such an intense and continuous tooth-ache as to last for hours together.

On pulps which have been exposed by penetrating caries we distinguish a partial as well as total inflammation. The first is to be sought for particularly in such cases where the perforation of the hard substance is limited to a small extent, and attacks only a part of the body of the pulp, perhaps the point of a papilla of a bicuspid or molar tooth.

The most prominent symptom is redness, proceeding from either over-fullness of the blood vessels, or extravasation into the pulp-tissue of blood-coloring matter, differing from that of the blood corpuscles. Between the congestive and diffused redness stands the hæmorrhagic, which appears red-sprinkled, formed in points or spotted. The boundaries of the extravasation gradually lose themselves in the parenchyma of the pulp. In partial inflammation the redness extends only to a section of the pulp-body, diminishing from the periphery

toward the centre; it embraces either the one or the other of the root-pulps or only their broad parts. The intensity of the redness fluctuates between a weak rose-red and a deep blood-red, often with a mixture of gray which more or less preponderates. From œdematous swelling the inflamed pulp presents a yellow-red appearance; and from superficial suppuration a pale, greenish yellow color.

The increase in volume of an inflamed pulp is effectively prevented by the hard, resisting substance in which it is found, and it is a matter of general opinion, that one of the causes of the severe beating and lancinating pains, is the resistance of the dentine. When we are certain that inflammatory tooth-ache suffers modification through local circumstances, we believe, although otherwise reminded, it to be intensive neuralgia under the most different anatomical relations. Swelling of the pulp in partial inflammation is limited to the one or the other surface, but in many instances it is well-nigh impossible to locate a partial inflammation. At best we only succeed in such cases where the inflammation occurs in an atrophied pulp.

In regard to duration, we distinguish an acute form a chronic inflammation, as is well known, by its different degrees of intensity. The more acute the course of the inflammation the more rapid will be the destruction of the panenchyma; the more chronic its course the more gentle will be their intervals; in the first case the consistency of the organ is perceptibly diminished, and may even run into a soft, pulpy state.

The suppurative process is nearly always developed as a sequel of caries, and is limited to the upper surface-layer or to the root part of the pulp which is in relation to the carious region. The suppuration appears as a greenish-gray or greenish-yellow, semi-fluid, stringy covering, which contains pus-corpuscles as its characteristic morphological ingredient. The contents of these are in most cases affected with fatty degeneration, so much so that on being treated with acid, their granules do not appear so distinctly, on account of the

fatty granules, and not unfrequently are the corpuscles so shrivelled and disintegrated that it is well-nigh impossible to distinguish them as such. The fluid inorganic matter of the suppurating mass is clouded with suspended fat-drops, which also appear aggregated in heaps of fat-granules. Under the influence of acid the mucuous is precipitated and becomes in form an out-stretched, thready, persistent mass.

We often meet with cases where, in the superficial and apparently suppurative substance of the pulp not a single pus corpuscle is found, but a mere agglomeration of shrivelled, obscure granules, which appear imbedded in a precipitated mass, resembling the white of an egg.

If we examine into the deeper layers of that part of the pulp infiltrated with pus, we are easily convinced that a process of rapid growth of the parencyma-cells in acute progressive cases, can be traced far into its interior and even deep into the pulp-roots. Sections of suitable pulps that have been imbedded in paraffin, lime or other similar substance, answer for this purpose. It is the tissue-cells of pulps, particularly in young persons which are subject to a high grade of proliferation. We often meet these with double-granular cells partly round and partly spindle-formed, in company with other manifold gliding and variously formed cells, so plentifully represented that they crowd upon each other, and the more as we approach the inflamed mass.

Finally we only see the element-organs still more pressed on each other, and covered over, which assume mostly a round granular appearance, and exist enclosed in a layer of protoplasm, which gradually becomes smaller.

If we observe the blood vessels, we can diagnose texture-changes in the inflamed masses at the point of over-flow, as follows: a swelling and loosening of the connective-tissue sheaths of the small arterial and venous vessels and also a cloudiness of the sheaths, proceeding from scattered or agglomerated fat-granules, or from numerous, sometimes large, sometimes small, often grouped granules, which fre-

quently cover the whole vessel entirely around, so much so that its characteristic appearances are lost, and can only be recognized as such by its continuation. Albrecht (*Krankheiten der Zahnpulpe*, 1858,) has called our attention to the considerable increase of volume, and the crooked and the greatly wounded course of the vessels.

We observe in inflammations which have become chronic, particularly, that the increased, long-continued, and oft-repeated blood-pressure upon the pulp, destroys the elasticity and contractility of the walls of the vessels; the element-organs of the connective tissue proliferate as soon as the vessel loses a certain mass of its usual succulent support. After expansion has occurred it can regain neither its first measure in length nor width; it becomes longer and wider, a bending-off sideways and often a varicose extension occurs, so that when it lies on the upper surface, bursts and bleeds easily, and occasions in the deeper part, the above mentioned extravasation. This state of things gives rise in its course to pigmentary and clouded appearances. If the vessels continue extended it is possible for the circulation to become interrupted, the changes of matter in their usual masses cannot go on, the matter which ought to be thrown off remains behind, which still further deranges its function.

The red blood-corpuscles as well as the white become necrosed by the stagnation of the column of blood; the first give over their coloring matter to the fluid around them, the pulp becoming thronged with blood coloring matter.

Texture changes also show themselves in the nerve-tube bundles near the inflamed masses. The most prominent symptom is their cloudiness, conditional upon their containing fat-corpuscles, which are sometimes scattered, sometimes aggregated and lying between the nerve tubes. (*Neutritis*.) The metamorphosis of the fatty-granules of the nerve-marrow is not proportionately spread out in a nerve bundle, so that the marrow of single nerve tubes may be free from fatty degeneration. In the connective tissue sheaths of the nerves we meet with the analogue of the

vessels; that is groups of oval or round granules, pointing out a proliferation of the element organs of the connective tissue.

We infer from this that the antecedents of inflammation in the nerve bundles of the pulp, whether followed by fatty degeneration of the nerve-marrow, or cell-increase of the interstitial connective tissue of the bundle, may have as a sequel through some painful impression, the destruction of the conducting medium in the axis cylinder.

The dentine cells in the vicinity of the inflamed mass suffer a fatty granular cloudiness of their protoplasm; their cohesion becomes weakened, and they gradually approach a total disintegration.

In acute spreading cases the fatty change occurs more intensively and extensively than in the chronic, and conjointly with this change proceeds the loosening of the pulp-tissue, which extends until reduced to a fluid state, so that there remains only a small part of discolored skin adhering to the pulp wall; extending also into the root-canal, and causing the rest of the pulp to be shriveled.

If we examine the entire aspect of an inflamed pulp we thereby discover the anomaly of matter-change; through an increased tendency of blood-flow to the pulp and a diminished one from it, we have an increased transudation, a piling up of excretory matter; further we have through a proliferation of cells, resembling the tissue support of the pulp and the connective tissue of the vessels and nerves, and also a production of masses of pus-corpuses; or larger, but immediately shrivelled granules, which proliferations together bring about a partial or total destruction of the pulp-parenchyma.

Acute inflammation of the pulp sometimes runs into a gangrenous destruction, which generally follows caries of both the deciduous and permanent teeth, as well as after dental periostitis, but seldom occurs independently. Like in other organs we distinguish two different and distinct forms of gangrene—a so-called moist and dry gangrene.

The signs of the moist consist in a greasy deep-red, reddish-brown, reddish-gray, or greenish-gray color, a change of its consistence to a thick pulpy state, with a remarkably persistent and specifically gangrenous smell. The pulp occasionally passes into a broken-down, curdy, crumbling, disgustingly stinking mass.

The tissue changes are known as inflammatory when the gangrene has not proceeded too far. It will be instructive to begin our investigation in the pulp-root and proceed toward the pulp-crown. The divided nerves as also the divided vessels indicate the proliferations just described, which predominate in masses as we advance toward the gangrenous portion, and finally cover the entire field. Thus the fatty degeneration grows in rapidly increasing progression. The contents of the nerve tubes crumble in one place and another. The walls of the vessels take on a fine granular appearance, and disintegrate before they are macerated; the oblong granules of their layers of muscular fiber lie scattered through each other. At the point where total gangrenous destruction has taken place, we notice a greasy yellow, yellowish brown-molecular detritus, generally containing imbedded in it numerous long, bow-form-crooked, acid fat crystals, like those in the sputa from pulmonary gangrene.

By the so-called dry gangrene of the pulp, there remains behind only a dark-brown, red-brown, tinder-like, or cuticular, slightly moistened mass, which no more fills up the pulp-cavity—a gaseous-flow occupies the remainder of the cavity. As histological ingredients, the following are named: red-brown or dark brown cylindrical masses (necrosed blood) enclosed in yet recognizable tubes (blood vessels.) These masses are an agglomeration of greasy yellow or brownish granules, and small granules of pigment crystals of haemotoidin.

If caries has preceded in a pulp which has become gangrenous, perforation of the pulp cavity in most cases has not yet taken place. In particular cases sealing up of the

cavity gives us the cause. Gangrene produced primarily, seems to affect particularly teeth affected by mechanical abrasion. Besides these causative agents it is not universally known that deleterious outward influences favor gangrene in an inflamed pulp.

When the red coloring matter of the blood corpuscles transudes through the undamaged walls of the vessels, or after the bursting of these walls it is drawn to the corpuscles, it penetrates the dentine and gives to the teeth a reddish color. (M. Heider und C. Wedl über geröthete Zähne; Deutsche Viertl. f. Zahnheilk, 1863.) This color generally appears at the neck of the tooth where the enamel and dentine meet. The redness in many cases extends only a short distance from the neck in the direction of the root, diminishes in color as it proceeds, and becomes at last a weak rose-red. In the other cases the redness is more intense and spreads itself towards the apex of the root, generally stronger on one side of the root than the other. The deepest color, however, can appear on a *part* of the root.

If we endeavor to ascertain from cut sections of the different layers of dentine the extent of the redness, we sometimes meet with a very weak color or none at all, upon the zone of dentine which lies against the pulp-cavity or the canal of the tooth, but there follows, however, a sometimes broad, sometimes narrow, briskly tinged middle zone, which undergoes a weaker coloring outwardly. The inner zone of dentine is tinged most lively in the middle.

Finely polished sections of the different zones of dentine give us the desired information in regard to the coloring substance which they contain. Even the dentine canaliculi from their sources to their finest ramifications are filled with red coloring matter, while the inorganic substance does not appear colored at all. The coloring matter here shows that *redness* which is common to the blood, and looks like a homogenous, ungranular, filled in substance of the canaliculi. That we may not be deceived in this regard, we have only to remember that such coloring on polished



sections does not take place in normal teeth. It is well known that tinges resembling the above can be produced artificially, by treating dentine with carmine, alizarin, Berlinblue, blood-red, &c. It can also be easily decided by experiment that the cementum does not take up coloring matter. If we cause the pigment to penetrate the dentine outwardly from the pulp cavity the dentine becomes colored, while this is not the case when the coloring matter is confined to the root of the tooth—the cementum does not become tinged.

We have immersed dried human teeth, after their crowns were broken away, in fresh rabbit's blood with the addition of about a quarter part of water. To prevent the evaporation of the water a layer of oil was poured upon it. After the lapse of about forty-eight hours, the uncovered plains of dentine were more or less extensively colored with a rose red, sometimes weak and sometimes more intensive. The prepared sections showed in the canaliculi of the dentine, the red blood coloring matter. To solve the question whether the red color of the dentine proceeds from the interior of the canal of the root, or from the layer of cementum outwardly or inwardly, the following experiments are given :

A six inch glass tube of suitable width was inserted into the open pulp-cavity of a lower molar tooth, and filled with rabbit's blood. Further, entirely sound teeth, the apical formina of which were securely closed with sealing wax, were laid in fresh rabbit's blood. The results of both experiments were decisive. In the first, it was colored an intense red, while in the last experiment the teeth manifested no traces of color though numerous sections were made.

The circumstance that different layers of dention appear sometimes more and sometimes less reddened can be accounted for in the different conditions which cause it. It is to be observed that the middle zone of dentine is more numerously ramified with canaliculi than the inner ones.

The red color of the dentine can only be brought to our eyes by the addition of reddened canaliculi, which can be seen shining through the inorganic matter. Should different modifications occur in their transparency, the red appearance will be correspondingly modified. The occasional yellow-red, rose-red, gray-red or gray-reddish color of different teeth, and the shades of color in the different zones of dentine confined within certain limits, do not come perhaps from changes of the blood coloring matter, or from its diminished imbitition, (we can readily convince ourselves of the proportionate color of the canaliculi by inspection), but stands, with respect to the transparency of the inorganic matter, in relation with dentine. In caries of the tooth, and atrophy of the tooth-pulp, the dentine has taken on, as we know, towards the pulp-canal and pulp-cavity, a greasy whiteness, mixed with grayish yellow; and indeed at all such points where caries has not yet penetrated. The diminished transparency of the inorganic matter associated with the above in the inner zones of dentine, prevents the coloring matter of the canaliculi from shining through. The appearance of the redness depends upon the condition of the reddened canaliculi.

If the dentine is so formed that the canaliculi present themselves shorter in extension than we will find that the redness is smaller than when laid out in their long extension, where the coloring matter meets our eyes in greater amount.

In the canaliculi of the dentine, which are enclosed in the ramifications of the dentine-cell processes, it takes on more nearly an imbitition than a capillary attraction.

The appearance of reddened teeth is limited chiefly to such as are carious, whose pulps show a high red color or extravasation, and which impart their condition to the red colored place of the dentine. It is also known that when incisor teeth are treated with arsenic for the purpose of filling, their crowns become rose-red in the course of a few days, and may continue so for months after the filling of

the tooth. This color often comes on without any previous signs, but often under appearances of congestion, always however brought about on teeth whose pulps were not removed by the nerve paste. It remains to say that red colored teeth have also been observed as death symptoms after cholera, typhus, and suffocation. Rose-red teeth with variations of their color at different times occur also as variation of formations. (Heider aus der Praxis; Deutsche viertlj. f. z., 1862.)

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## ARTICLE II.

### *Professional Shortcomings.*

A portion of an Address delivered by J. H. FOSTER, M. D., before the "American Academy of Dental Science," at the Third Annual Meeting.

There are several points regarding professional shortcomings, upon which I shall be plain spoken.

*First* and foremost in the sins of omission, then, may be classed that of an unhealthy condition of the mucous membrane of the mouth,—arising from neglect in not properly removing, as often as necessary, the accumulation and deposit of tartar, affecting alike injuriously both gums and teeth,—and not instructing the patient how best to secure a comparative immunity from disease, by the right way of using brushes, wood-pointed sticks, floss silk, etc. It is no uncommon thing to see this general sanitary condition disregarded in a mouth where other operations of great merit have been performed. In an economical point of view, if no other, it is of great importance to the patient, If, then, this operation is neglected, because the fee is disproportionate to the time consumed, why not equalize it? For both patient and operator this ounce of prevention will be worth incomparably more than the pound of cure.

Next in importance is the neglect to institute stated critical examinations of the teeth, dependent in frequency upon their character, structure, and organization, in different individuals, particularly at an early age. Buccal surfaces

of the Posterior Molares, not reached by the brush, and which once requiring to be filled, prove not only the most difficult operations to be performed, but the most uncertain, the same cause continuing to produce the same effect, unless the *preventive* course is pursued. How much better that it should be done before disease attacks them, by admonishing the patient, and imperatively stating the necessity for extreme attention to remote surfaces!

Another oversight is the neglect to discover disease until the enamel breaks in. This involves so much increased suffering to the patient, as well as difficulty to the operator, in the extra labor, time, and skill required, that more attention should be given to examinations; and if the operator considers it labor lost, let him charge a fee for his time. It would not, I think, be grudged by the patient, in view of immunity from present suffering, and the comforting assurance of security to his or her teeth for a still longer period.

It should also be considered a sacred duty on the part of the operator to instruct his patients how much their care may diminish the number of operations upon approximal surfaces, and, when the teeth have already been separated and filled, the necessity for keeping those surfaces clean and polished. The comparative durability of our operations depends much upon this, and earnest preaching may sometimes do as much good as practice, in ensuring a favorable result.

Carelessness in the mode of separating teeth, particularly the front incisors, is a point of grave consideration. Fillings cannot always be concealed, but often their edges, and sometimes a part of the fillings, are manifestly upon front surfaces, when they might have been under them.

No one would suppose that a man who had modelled and carved Artificial Teeth as a part of his education could ever lose sense of the importance of form and outline, and become unmindful or regardless of artistic skill in this respect, when operating upon the Natural Teeth. How common it is to see the latter mutilated and deformed, or so filed and cut

away as to render subsequent operations extremely difficult and complicated, as if "some of Nature's journeymen had made men, and not made them well, they imitated Nature so abominably."

The great importance of rounding, blunting, and making smooth, sharp edges and points upon the grinding surfaces, formed by the wear and tear of antagonistic teeth, is too much disregarded,—these knife and saw edges forming weapons of offence alike destructive to the teeth and to the fillings in them. The much-abused File, gentlemen, is effective; and if called into requisition more frequently in such cases would prove a valuable auxiliary for the modification of this evil, in a short and summary way.

I would earnestly protest against a new method of separating teeth, for the purpose of filling cavities upon approximal surfaces, called instantaneous wedging, that is, driving wedges with a mallet above the affected surfaces, under the gum, between the necks of the teeth, with sufficient force to obtain the same room at once which it takes ten days or a fortnight to effect by the gradual, slow, and safe old method.

The shortest way of performing operations,—as in all other things, the *fastest time*,—seems to have become the aim and purpose, the great desideratum of the nineteenth century.

How comparatively few operators treat dead teeth, prepare and fill nerve cavities, in the most approved, thorough, and scientific manner, after the superior modern method! Who among us that ever practised the ancient barbarous method of destroying nerves is not thankful for the modern, humane, and painless way of performing the same operation?

I congratulate you, my brethren, that in our specialty, as in the practice of medicine, the necessity for the use of the lancet is almost entirely abolished. I have several of these little instruments laid aside, with the name of "Dixwell" upon them, purchased long ago at the sale of the effects of that old physician of your city. Who can tell

how often they had been used in preceding years, in venesection, and how often since for opening abscesses consequent upon filling dead teeth after the old method, into which we were inducted by the most ancient and honorable of the profession?

Why, gentlemen, the old difficult way of withdrawing a charge from a gun, and the easy way with which its removal from a modern breech-loader is effected, is a just comparison. I have not opened an abscess, resulting from any fang operation of my own, for seven years, and might enter into a minute investigation of causes and effects, physiological and pathological, the consideration of which would occupy too much time.

Suffice it to say, that I consider this special success attributable to the *vis inertiae*, the division and subdivision of the operation; never excising and removing the nerve until the sensibility is deadened by chemical agencies; never filling the nerve cavity the same day that the nerve has been excised; never filling the crown cavity the same day on which the fang is filled, and at no sitting continuing the operation after a feeling of soreness is induced by the irritation of working upon the tooth; but applying kreosote to the interior, as a counter-irritant, close the external cavity for the time, with "Hill's Stopping," and wait till another day. Teeth which have been long dead, and have absorbed into their structure offensive matter, require still more time for their purification. Some writers have attributed injurious effects to the continued use of kreosote. I have never seen such results, when it is applied in homœopathic quantities only, however oft repeated. Great importance should be attached to perfecting this operation at the apex of the fang; and when Pivot Teeth are engrafted upon fangs, the latter should undergo a similar expectant course of treatment, thorough and complete, that after evil consequences may not ensue, and need not even be apprehended.

I come now to a very important point,—a consideration of the treatment of *Six-year* or *First Permanent Molars*.

Is there one observant person among us, in practice for the last quarter of a century, who has failed to see the gradually increasing change in the organic structure of this particular tooth? Instead of being what it once was, a *permanent* tooth, has it not become, to all intents and purposes, deciduous? This I affirm to be the general rule. Of course there are exceptions, but they only prove the rule, and are continually decreasing in number. In all its characteristics, color, external and internal composition, and organic structure, it has become a *temporary* tooth; and in a majority of cases has less power to resist the action of those agencies which attack and destroy these organs than the temporary teeth have been supplied with. We daily see them crumbling away in the first year of their development, under influences which they were once as powerful to resist as any of the other permanent teeth, nay, more so than the Bicuspidæ.

Some have been inclined to dispute this position, and defend these poor teeth, which have no defensive armor themselves. Others deny that they are weak subjects, and insist that with proper treatment they may continue as long-lived as the rest. But "facts are stubborn things." The only question is, what, under the circumstances, is the specific? What is to be the mode of treatment? My own convictions, matured and strengthened with every year, have become settled and established modes of practice.

I trust, however, that no one will be influenced to adopt any system advocated and urged by another, except by evidence based upon the result of his own practical observation; for

"He that complies against his will  
Is of his own opinion still."

Such converts are always clogs in the way of advancement.

I have no disposition to be considered "Sir Oracle," and desire only to awaken all to a consideration of matters having an important bearing upon professional responsibilities; to provoke agitation, excite discussion, and stimulate a

desire for disputation even; for out of this come light and truth.

Concisely, then, as to the treatment of the Six-year or First Permanent Molares, they should be *extracted* in a large majority of cases.

Admitting this rule, how are we to know the exceptions? Is there any definite period, any stated time, when this operation should be performed? I answer, *beyond certain limits*, no! It will not do to act upon the principle, "If t'were well t'were done, when t'is done, t'were well t'were done quickly." We must gather wisdom by observation and experience. Pursue an expectant course of treatment, so as to give them trial. Prove them, and learn whether their ultimate retention will be for good or evil. At all events, the attempt should be made to guard against their loss until the "Second" or "Twelve-year Molares" shall have been developed; and if we find the latter so far back as to be predisposed to disease, from inability on the part of the patient to reach them effectually with the brush, or a crowded and irregular condition of the teeth generally, thereby inducing disease, upon the approximal surfaces, *then* their extraction is *imperative*. In how many cases do we fail to see this combination consummated?

Great consideration should be given to the theory advanced some years ago, by one of my honored instructors, Doctor Joshua Tucker, and afterwards endorsed by Dr. O. W. Holmes and others, that "the jaws of the Anglo-Saxon race have contracted, and that, whereas there was originally room for sixteen teeth in each jaw, there is now room but for fourteen."

The *Wisdom Tooth* proves much more reliable, if the First Molares have been extracted early; the Second Molares having moved forward to fill the vacancy, it takes the position of the latter, and having thereby additional room to develop, becomes a much more durable substitute.

Many persons still practice upon the supposition that the First Molares can and should be retained, under any and



all circumstances, and insist upon pursuing the old theory of disregarding the preservation of the Wisdom Teeth. But if the front and lateral teeth are crowded and irregular, how is this *high pressure* to be reduced by persisting in this false theory and practice? I do not hesitate to affirm that any man, who ignorantly or wilfully shuts his eyes to the necessity of a *judicious thinning out*, in the mouths of young patients, may increase twofold the number of their operations in successive years, and incur the risk of losing both Six-year and Wisdom Teeth, besides increasing the chances of having to renew his fillings again and again, until finally, perhaps, in advanced life, his patients may find themselves in this condition, to use a scriptural quotation, "And behold seven thin ears, and blasted with the east wind." And he may then remorselessly cry out, "'Tis Cæsar's sword has made Rome's senate little, and thinned its ranks."

You will perceive, gentlemen, that I lay great stress upon this point. It is the *most important* one. More may be done in the way of prevention, by a judicious and wise course in this respect, than in any other.

When, in former years, it was deemed essential to advise the extraction of teeth in either jaw, in consequence of too crowded a condition, the response on the part of patients, or friends was "We will not consent to have sound teeth extracted." It seems to be an all wise dispensation of Providence that in view of the proportionate increase of disease at an early age, these Six-year Teeth have become what they are, so that we can imperatively say, under certain conditions, there is no use in trying to keep them, and the decrease of disease in the other teeth depends upon their extraction. But, alas! how many weak-minded, procrastinating, subservient men there are, ready to yield to solicitation or dictation, from mistaken motives of self-interest, or the promptings of a compassionate but injudicious humanity! "Fiat justitia, ruat cælum."

In the way of *professional responsibility*, there should be no hesitancy, no doubt, no misgivings; and he who decidedly

asserts and upholds his convictions will most surely receive the confidence of his patients, as well as maintain his own self-respect.

The popular cry, we know is, "Oh, we never extract permanent teeth; it is unnecessary,—*we* can save them! The *old fogies* advocate and practice such a course, but it is not at all in our way." What sympathizing parent is not most willing to be governed by this advice, to save a child the real and imaginary agony of extraction, bestowing at the same time a grateful regard upon *so considerate* a professional adviser? This delusion, however, must be short-lived, and woe to him who is thus influenced, and says, like Richard, "I have set my life upon a cast to stand the hazard of the die;" for ultimately he will surely die in professional *caste* and *reputation*.

Many there are, at the present day, who build superstructures upon such basis, at an immense cost, which are beautiful to behold, admirable specimens of artistic skill, and, if the substructure were only as perfect, might continue durable and serviceable; but, alas, too often there is no foundation, and the architect must be likened unto "A foolish man which built his house upon the sand; and the rain descended, and the floods came, and the winds blew, and beat upon that house; and it fell and great was the fall of it."

In concluding, a few remarks of a sanitary nature regarding ourselves may not be amiss. Most of us are overworked; and excess of work involves the need, particularly as we advance in life, of regular intervals of relaxation. Few of us are disposed to be governed by wisdom or common sense in this matter, until it is too late. It is a very poor economy, not to strengthen and utilize the physical power that God has given to man, to work out the term of his natural existence. None of us should be restrained from taking a long vacation from the fear of losing business. An earnest, conscientious devotion to the interests of our patients, will earn from them a grateful appreciation of our labors, and

the pressing need of resting from them for a season. How many there are, alas, who rest from their labors eternally, whose lives and usefulness might have been extended and multiplied!

When the old woman told her doctor that "she feared her health was failing, because, on reading the newspapers, she did not enjoy the murders as she had done," she caught a glimpse of a great principle. When you find health and spirits are failing, natural cheerfulness and interest in your work decreasing,—that you can no longer "Smile and smile, and torture while you smile," be sure your experience is in similitude that of the old woman's, and you are beginning to have an insight into the eternal fitness of things which govern the laws of hygiene. *Then* it will be wise for you "to take thought and know yourself, and stay your fingers in good time."

I cannot close without saying a few words upon one other subject, which has an important bearing upon professional character and responsibility. Though not a *prohibitionist*, I am an advocate for temperance at all times and in all things. A sense of professional responsibility and self-responsibility and self-respect should impel every one rigidly and strictly to observe and practise *total abstinence* from everything that simulates or inebriates *during business hours*. There is the greatest need of caution in this direction. The continuation and the winding up of an honorable professional career may hang upon this thread, and it can be severed in a day, nay, in a single hour.

Unceasing vigilance, habitual prudence, and circumspection are indispensable if we would secure and maintain our principles; for even *appearances* are proofs sufficient to suspicious and malignant persons. However truly we may have kept the faith, however pure in motive and in acts our lives may be, "we ne'er can shape them so that evil-minded men will not their own construction put upon them." These *temperance* principles, feelingly and seriously urged, have been the inviolable rule of my own professional life,

without exception; and I can point to their *strict observance* with the greater pride and satisfaction in the face of *false accusation* and *gross injustice*.

Finally, gentlemen, let us strive in every way to do all we can by precept and example to advance every good work, and to aid in encouraging institutions tending to this end. Let us believe in honesty of purpose; that no desires not bounded by the highest principle, no actions not guided by the light of conscience, can advance our true progress. There will always be individual cases of men governed by no principle or interest, except that kind of principle and interest which pertains to "the almighty dollar;" who make extortionate charges for their services whenever they can find subjects with more money than brains,—and the number of these is surprisingly large in every community. Such deluded persons are made to believe in the superior power, the magical achievements, the unequalled skill of their operator; and he whose real character is thus veiled by the illusion enjoys a short-lived prosperity, soon to be wafted away by the cold finger of truth and reality.

'Tis a trite remark, but one that forces itself upon us every day, that "gross deceit raises itself to high places, and sits in purple and fine linen, while Honesty is left to beg her bread, and plain Truth stands shivering in a blanket." Nevertheless the good and true man will not relax his exertions, from a despondent contemplation of the false success that stalks triumphantly in the walks of life. Nor will the pure-minded suffer his faith in human progress to decay and perish, because he cannot see that the world moves as his sympathy and hope would have it. "There is a silver lining to every cloud," and there is no well so deep but that the stars can be seen from its depths shining at midnight.

Let us, then, enlarge our confidence in the power to exercise a redeeming and reformatory influence over our fellow men; have more charity for their shortcomings, more patience with their infirmities, more faith, in the years to

come, in the gradual and ultimate triumph of goodness, virtue, and truth, over corruption, vice and fraud.

These sad anomalies that we daily witness in civilized life, these painful incongruities that disturb our sense of right and wrong, may, after all, be appropriate discords in the grand harmony of universal music, arranged by the Divine master.

"There's a divinity that shapes our ends,  
Rough-hew them how we will."

Let us, then, strive to be true and fearless, and to mix gentleness and love with fearlessness. Amid all mutations, and fluctuations of old schools and new, it will be the maximum measure of attainment that secures the vantage ground, and the honest, truthful, conscientious discharge of practical duty only that will ensure a memory and a name worthy to be enrolled on the pages of Time.

May this thought serve to awaken in all the desire to attain similar excellence, a like meed of praise, and the gratitude which blesses and sanctifies those who have exemplified in their lives a title to the appellation of a just man and a public benefactor.

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### ARTICLE III.

#### *Disease of the Antrum.*

By EDWARD W. ANDERSON, D.D.S.

In July last I was consulted by a gentleman I had known from boyhood, and who belonged to a family in which phthisis pulmonalis was hereditary. One by one had I watched his brothers and sisters, his father and mother, numbering originally perhaps six or eight, fall victims to this terrible disease, until all but he were dead. He then was pale and sickly looking—of about thirty years of age, and of a decidedly scrofulous cast. His cheek was so sunken and his form so emaciated, that one would have supposed at first sight that some frightful disease was preying upon his vitals, and required but a few more weeks to complete its

work and lay him in the grave with his kindred. He was not long in making known his sufferings, and I, by asking various questions, learned from him the following facts :

He, while in Baltimore some two weeks before, had a tooth extracted, (the right superior second molar.)

The removal of this was followed by a dark, bloody discharge which was disagreeable to the taste, and continued at times for two days, when it ceased. Soon afterwards the right side of his nose became sore; the inner corner of his eye inflamed; the cheek more or less sensitive to the touch and a slight pain on the side of the neck below the ear. In a day or two a profuse discharge of fetid pus began to pour from the right nostril and with this the above symptoms began to subside.

He went to a physician for advice and was informed that he was troubled by catarrh, which, with some prudence on his part, would get well of itself. He, however, thought he had better take muriate tinct. of iron three times a day. He consoled himself with this belief for a time, but finding that he was growing worse, and that the discharge was becoming more profuse and fetid, he determined to consult another physician. He did so, and learned from this gentleman that his disease was ozena, and that an injection up the nostril was necessary.

He, from some cause or other, losing faith in this decision, thought "he would visit me 'inasmuch as I was just from College, and hear what I would have to say about it, even if I had not put up my 'shingle.'"

I declared his disease to be inflammation of the lining membrane of the antrum, and advised him to consult Professor Gorgas, of the Baltimore College of Dental Surgery. He determined to do so, but on his arrival in the city he learned that Prof. Gorgas was absent from home.

This compelled him to seek aid elsewhere. He went to the dentist who extracted the tooth. This gentleman found on probing the palatine root that it penetrated the sinus, and he injected it copiously through this opening, with tepid

water. More than a tablespoonful of purulent matter was discharged through the nose, the removal of which gave much relief to the patient. The dentist gave him a wash (unknown to me) to be injected three times a week, and a physician gave him some pills to improve his general health. With these he returned home and requested me to do the injecting for him, a request I readily granted, because I was anxious to witness the different stages of the disease. As soon as the antrum was emptied, the constant dripping from the nose ceased, but every injection proved an accumulation of pus in the cavity, a fact which lead me to advise a more frequent use of the syringe. He readily agreed, and for more than a week every thing "moved on as smoothly as a marriage bell," and he began to believe himself almost well, in spite of my opinion to the contrary, and constant warnings against cold and exposure. He accordingly resumed his old habits of riding late at night, and, if occasion required, in the rain; and as a reward for this imprudence, contracted a severe cold. This irritated the antrum beyond measure, and its secretions were increased surprisingly. In order to prevent the pus from dripping from the nose, I had to inject morning and night during four or five days; but as the cold yielded to remedies the antrum got better and hope again revived.

From this my patient began to be extremely imprudent. In damp and chill as well as in sunshine, he could be found attending to his duties, and no influence of mine could keep him within bounds, and in consequence his disease gradually grew worse, and at the expiration of the sixth week he became very dispondent.

Notwithstanding he had not used the care he should have exercised in order that the remedies he had been using might act without hinderance, I thought I could see that they were not equal to the emergency, and determined to change the treatment. I gave him Professor Gorgas' favorite prescription :

Ry—Iodide of Iron, gtt. x.

Iodide of Potassa, gr. viii.

Cod Liver Oil, one dessert spoonful.

Take 3 times a day,  $\frac{1}{2}$  hour before meals.

Inject antrum with Permanganate of Potash.

This prescription acted like a charm. Notwithstanding he kept up his old habits of exposure on his farm, he began to improve gradually. Cold after cold was taken, but the effects of each succeeding one were less and less apparent. The orifice in the mouth began to assume a healthy appearance and to close, and his general health was much improved. In November, when, on the eve of starting to Baltimore to assume my studies at the Dental College, when I bade him adieu, he told me that he had not felt so well for years. Eight weeks afterwards he wrote to me as follows:

“My antrum is perfectly well. I can never express my deep obligations to you for effecting its cure, but hope the day is not far distant, when I will have an opportunity to act what I cannot now find words to express.”

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## SELECTED ARTICLES.

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### ARTICLE IV.

#### *“The Patent Flexible Edge.”*

By W. G. BEERS, L.D.S.

Among the numerous so-called “improvements” recently introduced to the dental profession of the United States, and which have been patented, is one called “Straight’s Flexible Edge,” consisting of a band of flexible rubber placed around the edge of hard vulcanite sets, and for which is claimed, perfection of fit, and infallible adhesion to the palate.

I do not intend attempting to write any elaborate praise or recommendation of the idea, but simply to place the manner of manipulation before the Canadian profession, and letting every one judge for himself by actual experiment of



the merits and demerits of the patent. That the plan suggested is not new has been clearly proven, and we would not be surprised to learn that it has been used years ago in Canada just as proposed by the patentee. I remember seeing a very similar combination of hard and flexible rubber in an obturator, at least five years ago, and several now assert that they have even used the rim as patented, for the purpose of securing closer adhesion of hard rubber sets. In the January number of the *Cosmos*, Dr. S. J. McDougall, of Boston, claims to have taught the method several years ago to his students. The question, however, for us, in Canada, is not so much as to priority of discovery, as to the real utility of the rim for practical purposes.

The flexible rubber as sold by the patentee, and which, we believe, can only be obtained from him, is no different to the flexible rubber which can be bought at the depots for the same purpose, except in being divided into strips of the proper width—two sixteenths-of-an-inch. Of course every one can divide the rubber for himself. The process is very simple. First, dissolve some of the ordinary hard rubber in chloform, and keep well corked. After the plaster model is drawn from the impression, trace upon it the exact margin at which the rubber is to terminate at the back of the hard palate, and around the alveolar ridge. It is advisable to make a thorough examination of the condition of the muscles and their attachment to the lips and cheeks, so as to avoid bringing the flexible rim too high. Particular attention must be paid to this, as the rim cannot be trimmed with the same impunity as hard rubber, and in most cases not at all. Immediately where this rim is to lie, the plaster should now be scraped the width and about the depth of the thickness of the rim to be used, so as to ensure a closer fit. The rim being flexible yields, when hard rubber would not, and what would give pain with the latter causes no trouble with the former. The rim is then stuck to the model with the chloform and rubber solution, a little at a time, and very closely and accurately; taking

care to close up the minutest hole, lest in packing, any of the hard rubber should get under and destroy the desired elasticity.

Now make the pattern plate of wax or gutta-percha—we prefer the latter—taking care to keep it the sixteenth-of-an-inch from the rim, so as to allow for the usual spread of the hard vulcanite in packing. Fill up the intervening space neatly with wax. The usual process of articulating and grinding on the teeth, may be done at this stage, or before the rim is placed on the model; but any building out of wax or gutta percha, and final finishing preparatory to putting the case in the plaster should be the least part of the proceeding.

The case is then placed in the first part of the flask, *taking particular care to cover the entire rim with plaster except at the inside edge to be united to the hard rubber.* At the back of the case the plaster is brought over and on the rim, and the grooves for the escape of the hard rubber must be cut in the second part of the flask for obvious reasons. The rest of the work is the same as in ordinary packing.

It will be observed, that the rim is a considerable obstacle in finishing up the set, and that great care must be taken not to damage it by the brush wheels in polishing. Felt cones, for pumice stone and soap, as well as whiting or rouge, are preferable to brushes in polishing sets made in this way.

In repairing, or adding the flexible rim to hard rubber, it must be remembered that it cannot be united to hard rubber already vulcanized. Grooves must be cut in the plate, hard rubber added to unite with that already vulcanized, and the flexible rim placed to unite and be vulcanized with the unvulcanized hard vulcanite.

I think that the advantages of accurate fit, &c., obtained by this rim, will be lost in the frequent renewal, which I believe will be found to be necessary, and the possibility of the rim becoming porous and offensive after a few month's wear. We know that obturators made of flexible rubber

require frequent renewal; and the general success obtained in fitting vulcanite sets without any flexible rim, will only commend this in cases where all other means to retain artificial sets in the mouth have failed.—*Canada Journal of Dental Science.*

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## ARTICLE V.

### *Poisoning from Chloral Hydrate.*

Reports of fatal results from the use of chloral are becoming unpleasantly numerous. Not long ago, we commented on a case recorded by Dr. Needham in the *Journal of Psychological Medicine*, where death followed the administration of this agent under skilled advice and in moderate doses, and there lie before us now the accounts of several other mortal accidents. In the *British Medical Journal* of the 25th ultimo, is given the first instance of poisoning by this drug reported in England, in the case of a clergyman who had acquired the habit of taking chloral at night, commencing with scruple doses. During two months, the dose was gradually increased, until it is estimated that he took fourteen or fifteen drachms in the ten days preceding the 27th of January, on the morning of which latter day he was found dead in his bed. The only abnormal post mortem appearances were increased vascularity of the stomach at its cardiac extremity and along the lesser curvature, with minute submucous extravasated patches of blood in the former situation (the patient had been a sufferer from dyspepsia); a marked congestion of the cerebral membranes, which contained about an ounce of red serum, and presented old adhesions to a small extent on each side of the superior longitudinal sinus; and pallor with softness and friability of the cerebral substance. "There was no increased vascularity in any part except the choroid plexus; no effusion in the ventricles, nor extravasation of blood." These appearances are very different from those observed in the autopsy of Dr. Needham's case, where increased vascularity per-

vaded the entire brain, the only point of resemblance between the two cases being that in both there was found great congestion of the membranes.

In the *Buffalo Medical and Surgical Journal*, Dr. Holbrook, of Palmer, Mass., reports the death of the wife of a clergyman in that town. This lady took the entire contents of an ounce vial of chloral, from which her husband had taken but three doses, the quantity ingested by her being estimated at over one hundred grains. About twelve hours afterwards, Dr. Holbrook found her in a comatose condition, with contracted and insensible pupils, injected conjunctivæ, livid face, and cold extremities; the heart's action very feeble. Death ensued in about fifteen hours from the time of taking the drug, the patient never recovering consciousness. No autopsy was made. [A recovery from a still larger dose of chloral is reported in the *Medical Times* of Oct. 15, 1870, in the case of a nurse in the Philadelphia Hospital, who took 460 grains in a single draught. Restoration was effected by means of sinapisms to the extremities, vigorous flagellation, and the application of a powerful Faradic current along the spinal column, the phrenic nerves and to the chest.]

The *Hartford Times* recently reported the case of Frederick Ripley, a station-agent at Avon, Conn., for whom chloral was prescribed as a hypnotic by a physician. For about ten days it was taken with pleasant effect; at the end of that time a fresh supply was obtained from a druggist in New Haven, the first dose of which was followed by death in half an hour. Coming from an unprofessional source, the account of the symptoms is of course unsatisfactory, but there seems to be reason to suspect that in this instance some irritant poison was mixed with the chloral.

The *San Francisco Chronicle* of the 7th instant, contains a highly sensational article on the death of a Mr. Hixon, of that city, who, on the recommendation of a friend, took one evening about an ounce of an advertised "elixir of chloral hydrate," and was found dead in bed next morning. In the

report of the coroner's examination, no mention is made of the condition of the brain and meninges; but the thoracic and abdominal organs are said to have been healthy, with the exception of slight traces of disease in the kidneys, and a somewhat congested state of the lungs.

When first unfavorable results from the administration of chloral were brought to notice, we were inclined to suspect the purity of the drug; but from a number of analyses published in the *British Medical Journal* it would appear that there is little variation in the samples of different manufacturers, at least as far as the English market is concerned. In six specimens examined, the percentage of chloroform by weight was from 68.11 to 69.61; the percentage of chloral hydrate in the corresponding samples being from 94.33 to 96.41. Nor does it seem, as has been feared, that an alcoholate instead of a hydrate of chloral is often found in commerce. It is, therefore, to physiological rather than to analytical chemistry that we must look for an explanation of many cases of chloral poisoning. Our knowledge of its physiological action is as yet very far from exact, the only established contradictions to its use being in cases of organic cerebral or cardiac disease, with a little heeded caution against its hypodermic injection. Three pharmaceutical points, however, it may be well to bear in mind: Firstly, that chloral hydrate when procurable in hard, transparent crystals is less likely to contain impurities than when in the form of an opaque, amorphous cake; secondly that a simple test of its purity is its property of disengaging chloroform when mixed with an alkaline solution, without alteration of color; thirdly, that if kept in mixture for any length of time, it is apt to undergo decomposition, which renders it either inert or dangerous, and that, consequently, all preparations ready-made for domestic use are to be unhesitatingly condemned.—*Medical Gazette.*

## ARTICLE VI.

*Case of Tumour Originating in the Soft Palate, and Protruding into the Isthmus of the Fauces.*

REMOVED BY OPERATION.

By KELBURNE KING, M.D., F.R.C.S.,

SURGEON TO THE HULL GENERAL INFIRMARY.

On the 16th of September last, Charles E—— aged twenty-eight years, consulted me regarding a tumour of the throat, of which he gave me the following history. About three months before he first experienced a difficulty in swallowing, arising from a swelling in the roof of his mouth. This had not previously attracted his attention, but he admitted that it was of considerable size when he first observed it. From this time it increased continually, and he experienced great inconvenience in swallowing, and in respiration, especially during the night; his voice also was much affected, rendering it difficult to understand what he said.

On examination, a large tumour was found to occupy the whole left side of the soft palate, pushing the uvula over to the opposite side, and almost out of sight. It nearly filled up the whole isthmus of the fauces. It extended downwards along the left side, filling up the hollow between the pillars of the fauces as far as the eyes could follow it in the direction of the palato-pharyngeal fold. The tonsil was seen stretched over its lower portion. It was about the size of an apple, and was of a globular form. On examination with the finger, its consistence was found to be hard, firm, and unyielding. It occupied the whole thickness of the left side of the soft palate, and could be felt terminating in a free, somewhat roughened margin behind the posterior nares; but it had no special attachment to the posterior edge of the hard palate, and could be completely isolated from the nasal cavity. The finger could be readily passed round the projecting part of the tumour, over which the tonsil and the mucous membrane were tightly stretched; but the attachment of the broad base of the tumour to the

outer wall of the pharynx, and parts beyond, could not be defined. The idea communicated to the finger was rather that of tight impaction than of absolute adhesion to the surrounding tissues. The tumour terminated below in the same way as above, in a roughened projection, round which the finger could be passed behind and below the anterior pillar of the fauces, on the outer side of the pharynx, external to the epiglottidean folds and the superior opening of the glottis. The boundaries of the tumour could thus be ascertained in all directions except one. Externally it was limited by the ascending ramus of the inferior maxilla. Internally it projected into the isthmus faucium, which it almost closed. Above it was incorporated with the soft palate, and projected upwards into the posterior nasal fossa; below, its free margin could be felt, distinctly projecting into the pharynx, and separated by a space from the opening of the glottis. Anteriorly it was limited by the palatoglossal fold and mucous membrane of the soft palate stretched over and pushed before it; posteriorly its internal limits were traceable by the forefinger along the outer surface of the pharynx; but no distinct answer could be given to the question as to how far its broad base extended in a backward and outward direction, where it must lie in close proximity to the parotid gland and to the carotid arteries. On making an external examination, there was nothing remarkable except a considerable projection in the hollow behind the jaw and below the ear, as if the parotid gland as pressed outwards.

The symptoms were felt to be urgent by the patient, and I therefore explained to him that unless some method could be found of removing the tumour, there was no other way of affording relief. He was quite convinced of the dangerous nature of the malady, and expressed himself as ready to submit to whatever operation might be proposed for his relief.

Eventually he was admitted into the infirmary, on September 27th. My first idea was to divide the inferior

maxilla at the symphysis, and to remove the tumour by incisions made within the mouth, but the impossibility of defining its posterior connexions deterred me; ultimately I devised and performed the following operation:—I determined to get at the tumour by laying open the face from the angle of the mouth to a little above the angle of the jaw, then sawing through the ramus to ascertain whether sufficient space could be obtained to detach the tumour from its connexions; if not, to remove what portion of the body of the bone might be necessary, and, in case of the great vessels being implicated in the posterior connexions, to command the possible hæmorrhage by first of all placing on the common carotid a ligature to be tightened at will. On October 15th the man was placed under the influence of chloroform, and the usual incision for ligature of the common carotid artery was made along the edge of the sterno-mastoid muscle. Here the first difficulty of the operation occurred. The patient could not be fully placed under the influence of chloroform, in consequence of the difficult respiration which it produced. The struggling which resulted, and the rapid respiration, made it very difficult to expose the artery. In opening the sheath a superficial vein was wounded; but, with a little patience, a double catgut ligature, preserved in carbolic oil, was passed round the vessel. This was not tightened, but left to the care of an assistant. An incision was then made from the angle of the mouth to the inferior maxilla, a little above the last molar tooth, and a ligature was placed on the dividend ends of the facial artery. The last two molars of the upper jaw were extracted, and the incision was carried across the masseter muscle as far as the posterior edge of the inferior maxilla. The masseter was then divided, and, a couple of arteries bleeding freely, I was about to place a ligature on them when I observed that, although the respiratory movements were regularly performed, no air entered the lungs. It was evident that the tumour had slipped down on the glottis, and prevented the admission



of air. I pulled the tongue forward with artery forceps, but without benefit, and, after a moment's hesitation as to opening the larynx, I passed my finger through the opening made by extracting the two molars, and found that I could lift up the tumour and allow the admission of air. Suffocation was thus temporarily averted; but as soon as I removed my finger the tumor slipped down, and the entrance of air was prevented. Holding up the tumour with my left forefinger, I sawed through the inferior maxilla about an inch above the angle; and then forcibly drawing down the lower fragment, I found that I had plenty of room to introduce my fingers into the cavity of the mouth, and command the position of the tumour. The danger of immediate suffocation being thus averted, I divided the soft palate to the right of the uvula, detached it from the hard palate, and thus obtained command of the upper portion of the tumour. I then made two incisions through the mucous membrane, one in front and one behind, enclosing the tonsil behind them; and, forcing my fingers behind the tumour, drew it out between the divided portions of the inferior maxilla. On my making a final incision to complete the removal, a terrific gush of blood took place. Holding a sponge firmly in the wound, I asked the gentlemen in charge of the ligature on the carotid to tighten it. Unfortunately the ligature gave way; and in attempting to pass another, the venous hæmorrhage, which had quite stopped, returned. This rendered the passing of the second ligature somewhat difficult, but it was finally accomplished, and the ligature drawn tight. Returning then to the wound in the face and throat, and removing the sponge, which had been firmly held in its place, I was gratified to find that the hæmorrhage was quite controlled. I then divided the lower portion of the mucous membrane, which was alone adherent, and completed the removal of the tumour and the superjacent mucous membrane. On examining the cut surface, no vessels of any size could be found divided, but a small artery on the right side of the soft

palate, of course not commanded by the ligature on the left carotid in the neck, bled freely and required a ligature, which was easily applied. The wound was brought together by sutures, a compress was left to prevent venous hæmorrhage in the neck, and the operation completed.

On examining the tumour, it was found to be of a surely fibrous character, firm and homogeneous throughout. It was completely enucleated, having no firm adhesion to any of the surrounding tissues, not even to the mucous membrane which covered it and had seemed to be inseparable from it.

The following is the result of a microscopic examination, made by my friend Mr. Hendry, of this town:—"The tumour itself is decidedly *fibrous*, with abundant granules and nuclei. The mucous membrane of the velum and uvula is, on its anterior surface, healthy, with beautiful large pavement epithelia; on the posterior surface are innumerable cylindrical and ciliated epithelia. Both surfaces are apparently healthy. The tonsil gland is filled with nuclei and lozenge-shaped epithelia, with fibre-cells. The small tumours attached to the tonsil were vesicles filled with a purulent-like matter, abounding with fibre-cells, inflammatory corpuscles, and a very large amount of cholestine, in crystalline plates."

On reviewing the operation, the first thing that struck me was, that while the fear of hæmorrhage was the danger most present to my mind in planning it, the real danger, that had nearly proved fatal in the performance, was suffocation. Though there was a most profuse gush of blood at the moment of the final incision of the tumour, I believe that it was occasioned by the vessels which no doubt freely supplied a structure of rapid growth, and that they probably would have been commanded without recourse to the ligature of the carotid. This, however, I could not know previously. I have been unable to find any record of a similar case; but if one in all respects similar should occur in my practice again, I would dispense with the preliminary ligature of the carotid.

The rest of this man's history is soon told. As almost all the soft palate was excised, and a large wound existed in the side of the throat, I gave directions that no food should be given by the mouth, and that he should have beef tea freely administered by enemata. In the evening he looked wonderfully well; and the next morning (October 16th), having had a good night, he expressed himself as feeling comfortable. Ice was administered by the mouth, and he had another good night. On the 17th, he said that he could swallow the water from the melted ice, and was allowed milk and beef-tea, of which he partook freely. On the 18th, he had a restless night, and the face was somewhat swollen, but his general condition was satisfactory. On the 19th, the left side of the face was red and swollen, the left eyelids were puffy, and swallowing was difficult. The whole surface of the face was painted with styptic colloid; twenty minims of tincture of the muriate of iron were administered every three hours; the bowels, which had not acted since the morning of the operation, were relieved by an enema; and afterwards the administration of beef-tea in this way was recommenced. On the 20th, the parts of the face which had been covered by the styptic colloid were considerably relieved, but the erysipelas had extended to the neck, where large bullæ were formed; his general condition was much as on the day before. The remedies were persevered with, and champagne taken freely by the mouth. On the morning of the 21st, while there was but little if any extension of the erysipelas, his general condition was more depressed, his pulse was weaker, and he seemed to take less notice of what was going on about him. In the afternoon and evening the symptoms of sinking became more marked, his extremities getting cold and the tendency to restlessness increasing and he died at 9.20 p. m.

In considering this result, it must, I think, be admitted that death arose, not from any necessary consequence of the operation, but from an accident. There were one or two cases of erysipelas in the house at the time. I was myself

unfortunately in attendance on a very disastrous case, which, commencing on October 13th, terminated fatally on the 17th. This man had survived the immediate results of the operation; the power of swallowing was restored; the wound in the face had all but healed; the division of the inferior maxilla could not be looked upon as hazardous; no secondary hæmorrhage had taken place; from leaving the operating table till his death he did not lose one drop of blood. All the legitimate dangers, except those in connexion with the separation of the ligature on the common carotid, had been surmounted; and where so many and so great difficulties had been overcome, it seems all the more to be regretted that death should have arisen from a cause which a better acquaintance with physical laws will some day enable us to avoid, and which was foreign to the peculiar risks entailed by this very formidable operation.—*London Lancet*.

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## ARTICLE VII.

### *Indications for Lancing the Gums.*

It is but a short time since I sat at the feet of learned professors in a medical college. It seems, therefore, a little presumptuous for one who is but just getting his own wisdom teeth, in the things of our art, to write an article for a medical journal. Yet perhaps its readers, in their clemency, will bear with me a little.

One of our professors, I well remember (and he was my ideal of a lecturer), in expatiating on the effectiveness of the homœopathic remedy in almost every condition of human suffering, took occasion to denounce the practice of lancing gums in difficult dentition. He said considerably on the subject, the sum of which was, that in true homœopathic practice, lancing was *never* called for.

Now it so happened that I grew up on the farm, and, as the lecture went on, I bethought myself that I knew something about the young of animals, if I did not of babies.

So, at the risk of a little chuckle at my own expense, I made bold to remark, that, in tending my father's flocks, I had, I thought, saved many a lamb by timely cutting its gums. I had often found them prostrate on the ground, frothing at the mouth, moaning and refusing all nourishment. A little examination would show a thin, tough glistening membrane, drawn tightly across the incisor teeth; cutting this seemed to give almost instantaneous relief. The lamb would at once take to its mother, and soon be as lively as its fellows.

I remarked further, that it was well known among farmers that young colts often died for want of a little assistance in hastening the eruption of backward teeth.

Well, I drew upon myself what I expected—a little laugh, and many a look which said, you had better have kept still.

But, to continue: Now that I am having a little practice in caring for babies, I must give you a bit of experience in that line.

A few nights since I was called, in great haste, to see a child that just had a fit. I found the child was having spasms. I administered the homœopathic dose according to the symptoms as they appeared to me, and I thought with some success. The patient had no more spasms for a number of hours. But the paroxysms returned. I applied myself diligently, seeking counsel from Guernsey, Raue, Lippe and others, that, if *possible*, I might get the remedy that was *exactly* homœopathic to the condition. But the spasms kept coming more and more frequent, and harder, and it did seem as if the child must die. The parents gave it up. But finally, as it came out of a terrible spasm, and just as it was going into another, I went for the little tooth, which was pressing hard against a glistening tough membrane. The operation was soon done, *and the little sufferer was just as soon relieved*. It went right to sleep, and slept sweetly for half an hour, and it has not had another spasm yet.

Now, of course, I can but blame myself for not using the lancet sooner. But how much of blame rightly belongs to that professor for the influence his lecture had on me, I

leave for others so judge. Hereafter I shall profit from my early surgical experience with the lambs, and *especially* from this recent case in the baby. I shall, however, make a distinction between retarded dentition and difficult dentition; that is, if I find the teeth of sufficient length to protrude above the gums, and yet pressing hard against an unruptured covering, I shall do a little cutting as well as a little dosing. All honor to the single homœopathic remedy, and to the high potency, too, if you please. I believe in both; but hereafter shall endeavor not to be *too* conservative in the use of the knife or in the use of any mechanical interference that may best meet the wants of the given case.—*Med. Investigator.*

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## MONTHLY SUMMARY.

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*Bibliographical and Microscopical Section, Academy of Natural Sciences.*—At a meeting of the Section, held Monday, February, 6, the Director, S. W. Mitchell, M. D., in the chair.

Mr. Wm. H. Walmsley exhibited slides showing the difference between the torn edge of our ordinary paper and that of the thick, strong paper used by the Chinese for the manufacture of clothing. Both appeared to be of cotton, but the foreign article bore the aspect of being made directly from the cotton fibres instead of from comminuted woven fabrics.

Dr. J. H. McQuillen directed attention to the remarkable specimen of hypertrophy of the roots of a left superior first molar tooth measuring  $2\frac{1}{2}$  inches in length by  $2\frac{1}{8}$  inches in circumference, and weighing  $12\frac{1}{2}$  pennyweights, which he had exhibited at a previous meeting, and of which he had promised to make a microscopic examination. This he had done, and now submitted the results under the microscope, in three sections, taken from the same locality, one under the other.

As he had anticipated, the growth proved to be hypertrophy of the cementum.

The term exostosis, frequently applied to this growth, was open to exception on account of the fact that there are certain characteristic differences between cementum and bone, which

any one at all familiar with the microscopical anatomy of these two structures will readily recognize.

With the view of making this difference apparent to those unacquainted with the subject, he had placed under one of the microscopes a section of bone. This specimen shows a transverse section of the Haversian canals, with the lacunæ and canaliculi arranged around them in concentric lamina. In the cementum, on the contrary, there is an entire absence of the Haversian canals, while the lacunæ and canaliculi are quite numerous.

The three sections from the hypertrophied structure differed from each other in a somewhat remarkable manner, when we take into consideration the fact that they had been in such close contiguity. In the first, an outer section, the lacunæ and canaliculi are presented in the usual arrangement of cementum. In the second section, taken immediately adjacent and below it, there are, in addition to the lacunæ and canaliculi, a number of irregular spaces; while in the third section, the lacunæ are largely increased, and the canaliculi are more numerous and increased in length, running in a spiral direction analogous to dentinal tubuli in secondary dentine.

Dr. F. W. Lewis inquired what difference there was between these exostoses and epulis.

Dr. James Tyson replied that, microscopically, true epulis is a fibrous tissue, but that the term is often erroneously applied to the so-called myeloid tumors of Paget (the giant-celled sarcoma of Virchow) which have a similar situation,—that is, any of the structures about the jaw-bone, periosteum, and fibrous mucous membrane,—and which are cellular, or contain at most a small amount of fibrous tissue. Dr. T. also suggested that it seemed at least more natural to place cementum and bone in the same category, since the former differed from true osseous tissue only in the absence of the Haversian canals, the object of which was merely to contain the minute blood-vessels, which were here unnecessary on account of the close contiguity of the structure (cementum) to its vascular supply.

Dr. McQuillen stated that the various characteristics of enamel, cementum, and bone had induced Prof. Owen and others to draw the distinction which he had mentioned.

Dr. Tyson showed an ingenious gastric canula, improved by

being fitted with a cover and catch, for preventing the loss of gastric juice by the animal scratching it open.—*Med. Times.*

*Function of the Prostate Gland.*—Dr. Kraus, editor of the *Vienna Medical Times*, contributed to the *Medical Times and Gazette*, February 11, 1871, a preliminary communication in regard to the seminal fluid and the influence of the prostatic secretion on its physical qualities. The conclusions arrived at are—1. The seminal fluid, as long as it remains within the testes, vesicles, and other seminal passages, is colorless and scentless, being in appearance exactly like fresh honey while deposited in the comb; and in its reactions it is neutral. 2. Only when it has quitted the passages and arrived in the urethra does it acquire its white color and its peculiar faint smell. 3. During its passage through the prostatic portion of the urethra, the prostate empties out its fluid, colors the semen white, and confers upon it the faculty of coagulating when exposed to the air (alkaline reaction). Semen taken from the seminal vesicles does not coagulate, but remains clear, colorless, and scentless. The spermatozoids, in the absence of the prostatic fluid, cannot live in the mucous membrane of the uterus of mammalia; but with its aid they may live for a long time in the uterine mucus, often more than thirty-six hours. From his experiments, which are not yet published, he draws the conclusion that the prostatic fluid exercises an unlimited influence on the viability of the spermatozoids, sustaining it when endangered by the mucus secreted by the mucous membrane of the uterus.

*Fibro-Serous Cyst of Jaw.*—Dr. Sayre exhibited, at a meeting of the N. Y. Pathological Society, a fibro-serous cyst removed from the inner angle of the left jaw of a gentleman aged 35. The tumor had been six years in growth, but had grown very slowly until last year; since then it has grown rapidly. (Two photographs of the case were exhibited, and the patient himself was also present.) Dr. Hamilton had seen the case in consultation, and had advised incision, on account of the depth of the tumor and the adhesions. Dr. Sayre decided, however, to perform excision, if possible. The adhesions were found more firm than had been anticipated, and there was some difficulty in



dissecting the sac out. The jugular vein was exposed for 1½ inch, but not injured. The fluid oozed out of the sac, during the operation, but it was again rendered tense by a silk ligature passed round it, and at last came out entire. No vessels were wounded, so no ligatures were required. The operation was performed last Sunday week. The incision was made parallel to the fibres of the sterno-cleido-mastoid muscle. Excision in this case proved better than incision.—*Medical Record.*

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*Neuralgia of Jaw.*—The case to which I would first direct your attention this morning, is one of neuralgia of the jaw-bone, first specifically described by Professor Gross, in a paper read before the Surgical Section of the American Medical Association, at Washington, in May last. He attributes the disease to compression of the branches of nerves distributed through the wasted alveolar process depending on the encroachment of osseous matter upon the walls of the canals in which they are inclosed, in edentulous persons. It is most generally met with in elderly persons. It is more frequently seated in the upper than in the lower jaw. The morbid action is generally limited to the osseous structure, but not always. It can only be relieved by the removal of the affected alveolar process.

J. D——, a farmer, aged 63 years, has been suffering, for a number of years, with neuralgia of a most aggravating character, in the left side of the face. A year ago, I performed Carnochan's operation, of exsecting the second branch of the fifth nerve of the left side with great relief. You see, now, the marks of that operation on his cheek.

Within a month, however, the neuralgia returned, and located itself in the left alveolar process of the upper jaw, and since then he has suffered the most excruciating paroxysms of pain, which last a few minutes, and then cease, to return again after a short interval. The paroxysms are always rendered worse by movements of the mouth, as in talking or eating. His general health is not good, his sleep is disturbed, his appetite is bad. Medicines have had no effect in even relieving his sufferings, and he has come to us again for surgical relief.

In examining his mouth, you will observe that all the teeth

on the left side have been lost, and that the alveolar process, from the lateral incisor to the second molar, is enlarged, tuberculated, and as hard, apparently, as ivory. The remedy I will use, in this case, is excision of the affected alveolar process. I will make an incision along its ridge, from the incisor to the second molar tooth, turn aside the soft parts, and cut off the affected bone with bone forceps and gouge.

(The operation was performed as described. The bone removed was hard and eburnated. There was but little hemorrhage, and very little suffering afterwards. On the third day the patient left the hospital, having slept two nights without interruption.—*Surgical Clinic of* PROF. BRIGGS.—*Nashville Journal of Medicine and Surgery.*

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*The Virtue of the Sunflower.*—Mr. Martin, in a paper by him to the Societe Therapeutique de France, affirms that the common sunflower, extensively cultivated, has the effect of neutralizing the unwholesome vapors which are so fatal to health and life in marshy districts. The Dutch, who live only by dyking and draining their low lands, and are therefore good authority, pronounce sunflower culture a specific for intermittent fever,—the scourge of Holland. They assert that it has disappeared from every district when the experiment has been tried. It is not yet known whether this is the result of its rapid growth producing oxygen, or whether it emits ozone and destroys those germs, animal and vegetable, which produce that miasma which brings fever in its train.—*The Pharmacist.*

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*Test for the Purity of Chloral.*—When a fragment of pure hydrate of chloral is placed in a test tube or wine glass with a little water, and a few drops of liquor potassæ allowed to fall upon it, no discoloration takes place, and there is evolution of pure chloform, which can be detected by the odor. If the specimen experimented with is *impure*, a *dark* or *brown* reaction will result, and the odor evolved will be unpleasant. In this way a certain class of common impurities may be detected. In an article upon this important agent, to be published soon, we shall give a more extended account of it in all its relations.—*Boston Journal of Chemistry.*

*Undeveloped Eye Tooth.*—The second specimen exhibited by Dr. Sayre was a portion of an upper jaw containing an undeveloped eye-tooth. The specimen had the following history: Nine years ago a woman had presented herself with supposed cancer of the upper jaw. There was a tense shining swelling and apparent epulis of the upper jaw-bone. It was thought advisable to make exsection of the jaw. The tumor broke and blood escaped. There was considerable sloughing and more or less pain. The patient was discharged. A week ago she presented herself with a portion of the jaw still left. This was removed with a pair of forceps, and with it a large eye-tooth which had not been developed, and which was probably the source of all the irritation.—*Medical Record.*

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*Osborn's Neuralgic Pill.*—T. C. Osborn, M. D., Greensboro, Alabama, writes to the editors of the *New Orleans Journal of Medicine*, that the subjoined combination is very effectual in cases of neuralgia: R. Zinci cyanuretum, gr. vj.; quiniæ sulphas, gr. ix.; morphiæ sulphas, gr. iss.; ext. belladonnæ, gr. iij. Ft. pilulæ No. vj. S. One pill every six hours until the pain is relieved.—*Drug. Cir. and Chem. Gaz.*

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## EDITORIAL DEPARTMENT.

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*Dental Items.*—At a recent meeting of the Medical Society, of London, Mr. Napier read a paper on "An Improved Method of Filling Teeth," and exhibited some specimens in which cavities caused by decay were severally filled up with hippotamus ivory, mother of pearl, and India rubber, vulcanized to the consistence of ebony. Mr. Napier desires to obviate the necessity for using metal in any form for filling teeth, and read this paper with a view to prove the importance of the object he advocated. He argues that one of the principle causes of chronic inflammation in teeth that have been filled according to the method now in general use, is that metal is a readier conductor of heat and cold than the natural substance of which a tooth is composed. The improvement he advocated would benefit both operator and patient. We are of the opinion that time will prove this so-called improvement to be no better than many others which have heretofore been brought to the notice of the profession as substitutes for metal.

The "*Canada Journal of Dental Science*" publishes an article on the "Inflammability of 'the new base 'Pyroxyline'" from Dr. J. Neelands, in which he says:

"It may not be very generally known among dentists what an extremely inflammable substance pyroxyline is, and how easily a set of teeth may be destroyed by coming in contact with anything that is ignited. A short time ago an acquaintance of mine came up to the office in the evening, and I took him into the laboratory and showed the new kind of base I was using for artificial teeth. We each sat down and smoked a cigar. Just as we had entered the hall, about to leave the office, on turning round we observed the room we had just left brilliantly illuminated almost equal to that produced by the magnesian light. I rushed back and found my pyroxyline plate in a blaze and being rapidly consumed. On making an examination I discovered that when we left the room I happened to lay a lighted cigar in close proximity to the case of teeth, which set it on fire. It will require some degree of care on the part of those using this material not to allow lighted cigars, matches, or anything of that sort, to come in contact with it when out of the mouth. It might prove somewhat hazardous for an individual wearing a set of teeth made of this material to accidentally put *the wrong end* of a lighted cigar in his mouth.

Dr. W. H. Eames in the "*Missouri Dental Journal*," gives Hale & Eames' "Method of Casting Aluminum Plates," which any member of the profession is at liberty to use in his practice, free of charge. It is as follows:

"The impression is taken in the ordinary manner, with plaster or wax. If an air-chamber be desired, the form of it is cut in the impression. The model is made of plaster and French chalk, equal parts; fine white sand may be used instead of the chalk, but it is not so good. The model should be about one and one-half inches thick, and of such form as to draw readily from a plaster mould formed around it. While the model is yet soft, a small eyelet, made from ordinary wire, should be set in the centre of the back, opposite to the face. It should be completely buried in the substance of the model, so that it will be no more than flush with the surface when the model is trimmed. In trimming, cut away from around the eyelet a little, so that you can grasp it with a pair of pliers; the object of this eyelet being to aid in the removal of the model from the flask. Grind the teeth and articulate them as for rubber; place them in position with the trial-plate on the model. The trial or model plate should be made of sheet tin, lead, or wax. If wax be used, it should not be thicker than No. 20 gold plate. There should be no surplus wax, except at a point just back of the tooth or teeth. The trial-plate may pass up underneath the

gum of a single tooth, but in no case should a particle of wax overlap the gum or edges of the teeth. When the case is ready for the flask, the plaster teeth, if there be any on the model, should be trimmed off, and if there be any under-cuts that would interfere with the removal of the model from the mold in the flasks, they should be filled up, or better, cut out. The sides and other exposed surfaces of the model are now to be covered with tin foil, to prevent the plaster adhering to it in flasking. Varnish should never be used for this purpose in this process. The foil is made to adhere by moistening the surface with saliva. It should not cover any portion of the artificial teeth. The flask consists of an ordinary cast-iron sand-ring, about two or two-and-a-half inches in depth, of the form of the letter D, one end larger than the other. They may be had at any of the dental depots in nests of four sizes. A bottom is formed, of Russia sheet iron, to fit into the small end, as follows: A piece is cut the shape of the end to be fitted, but half an inch larger. Slit the edge all round to the depth of half an inch and turn it up at right angles with the surface; this turned-up edge passes up into the flask and retains the bottom when the case is flaked. A hole one inch in diameter, of the form of the bottom, should be cut from the centre. To flask the case, place the model, face upwards on a marble slab or piece of glass; several pieces of fine wire, about two inches in length, should now be set in the surface of the trial plate at right angles with it. If the case be one of two or more teeth, one tooth in a place, a wire should be set into the wax immediately back of each tooth. One wire will be sufficient for a block of three teeth; two or three wires should be distributed over the surface of the plate. The object of the wires is to form outlets for the escape of the oxygen which is forced out of the metal, when the flask is closed under pressure. Place the ring or flask small end upwards around the model. Mix an investment of equal parts of plaster and French chalk, or white sand, to about the consistency of thick cream; fill round the model in the ring carefully, allowing no air-bubbles to be retained. When the flask is full, place the bottom in position, letting the wires pass through the hole in the centre; be particular to have the bottom flush with the edge of the flask. When the investment is hard, remove the wires by drawing them out, warm the case slightly, (not enough to melt the wax), grasp the eyelet in the model with a pair of pliers, and tap the edge of the ring gently until the model is loosened, it can then readily be withdrawn. Remove the trial-plate and every particle of wax and tin from the mold and the model; cut small outlets in the sides of the model for surplus metal; with a small unannealed broach make three or four vents near the centre of the model by passing the broach through from the back to the surface. The

model and mould should now be thoroughly dried; this may be done by placing them separately over a gas-stove or in an oven. When dry, put them together, place the case in a charcoal fire, heat up gradually to red heat. Having previously prepared the metal by casting it into an ingot, in size sufficient for the case, melt it in an ordinary crucible; when melted, and the case is red hot, take the case from the fire, remove the model from the mould by means of the eyelet and a pair of long nosed pliers, blow out the ashes and dust that may have fallen into the mould, and pour in the metal, return the model, place the case in an ordinary rubber press and force the model down slowly, till flush with the top of the ring; let it stand till cold. The case can now be taken from the flask and finished. To do this, first saw off all the surplus metal round the edges; dress down the surface with burs and scrapers, and finish the same as rubber, except the polishing, which is best done with the burnisher."

Dr. C. J. Essig in the "*Dental Cosmos*" gives the following method of "Obtaining Impressions of Difficult Partial Cases," as follows:

"To obtain correct impressions of difficult partial cases, where the position of the remaining natural teeth form dovetailed or keystone shaped spaces, or where by the recession of the gums, we find teeth with narrow necks and broad, cutting edges, a form of tooth which cannot but increase the difficulty of securing an accurate model of the mouth, the use of plaster will be found to produce the best results, both as to correctness and comfort to the patient. In many of these cases, especially in the mouth of aged persons, some of the remaining teeth may be found to be loose from the recession of the gums, and the surrounding tissue so inflamed and sensitive, that even the pressure necessary to obtain an impression in wax would cause pain to the patient and danger to the loose teeth.

"An impression cup should first be selected of the proper size and shape,—those with the flat floor are best for partial cases; the plaster should be mixed thin, almost as thin as water, adding chloride of soda to facilitate setting. Plaster mixed in this manner does not become as hard and unyielding as that mixed merely to saturation. Now oil the cup so that so that it will readily separate from the impression when hard, fill the cup as soon as the plaster thickens sufficiently, then with a small spatula, place a layer of the soft plaster in upon the palatine surface, otherwise by inclosing the air in the deep portion of the arch the accuracy of the impression may be impaired. After this precaution, the cup is placed in the mouth, and gently pressed up until its floor comes into contact with the teeth.

When the plaster is sufficiently hardened, remove the cup, which from its having been oiled, is done without difficulty; with the thumb and index finger break off the outside walls, the portion covering the palatine surface is then removed by the use of a blunt, steel spatula, curved at the end in the form of a hook. The pieces are then placed back into the cup, where they will be found to articulate with perfect accuracy.

"Should the first attempt be rendered futile, by a tendency to nausea, or troublesome gagging on the part of the patient, camphor-water, used as a gargle, will, in nearly every case, prove an effectual remedy. (The credit of this valuable discovery is due to Dr. Louis Jack.") (We are of the opinion that the credit belongs more properly to Prof. P. H. Austen, whose method of taking impressions of partial cases has been demonstrated in the Baltimore College for years. ED. JOURNAL.)

"In cases of fracture of the inferior maxillary, it is often necessary to obtain an accurate impression, in order that an apparatus may be constructed which, by clasping the teeth, will assist in holding the portions together until nature brings about a sufficient union. In such cases we could not think of forcing a mass of wax into the mouth and down around the teeth; indeed, the very pressure necessary to do so would force apart the broken bones, especially if the fracture be a compound one. By far the better plan would be to employ plaster, in the manner described for difficult partial cases.

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*Erratum.*—In the November number of the *Journal*, 1870, the name of the author of the article, entitled "The Effects of Animalcules on the Teeth," appears as Geo. B. Harrimore, D.D.S., which is an error, as it should be Geo. B. Harriman, D.D.S., Boston, Mass. In making out the Index of the present volume we discovered this error, and take the first opportunity offering to correct it.











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